Smithsonian

November 1990

From ad to art

The Michelin Man in stained glass **(p. 138)**

The Jaguar XJ-S. Prod
And Luxury Are No

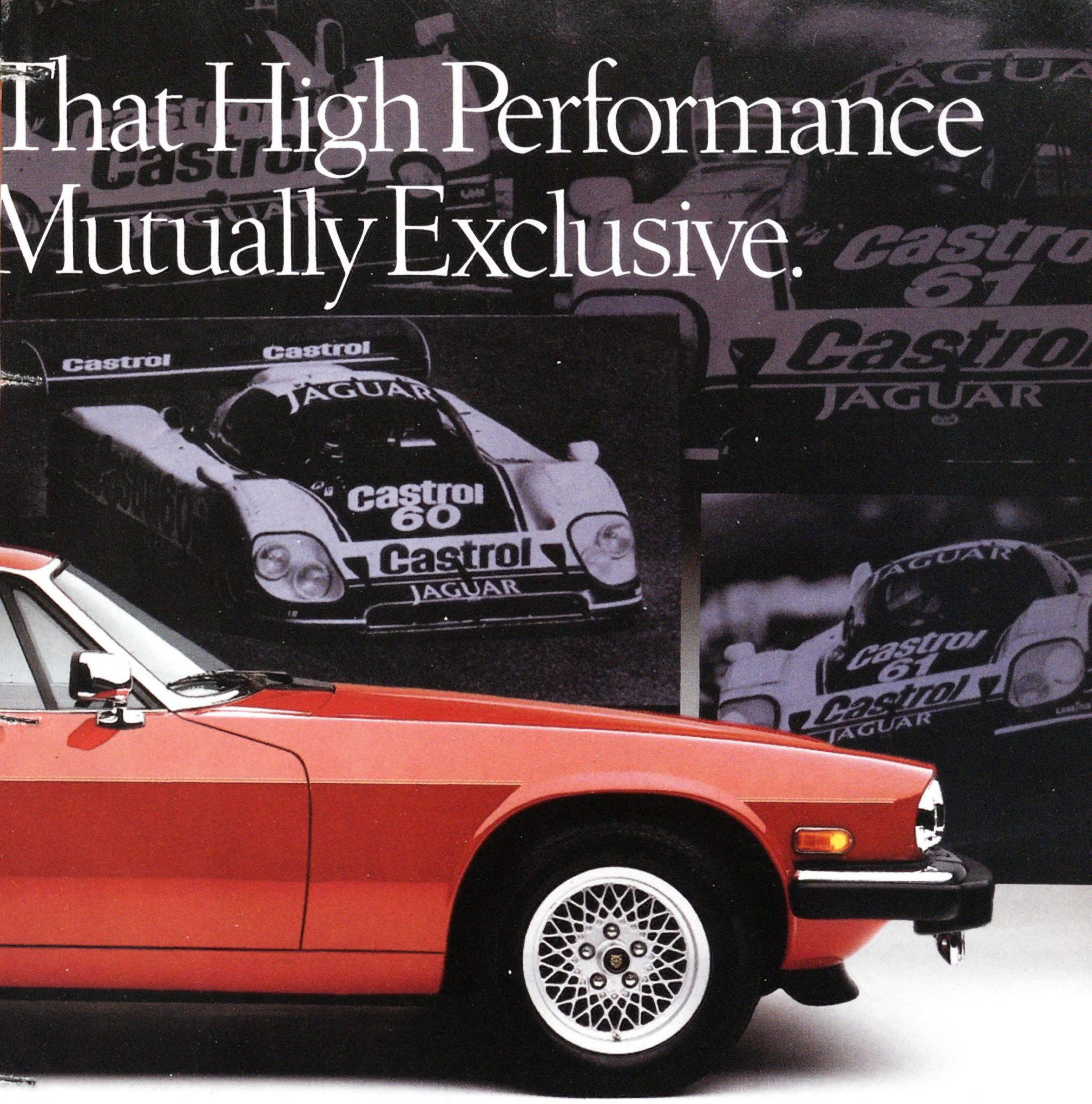
If the rewards of driving a high performance car seem inextricably linked to a spartan interior, we'd like to offer a few words of comfort: The Jaguar XJ-S.

Inside the cabin, an environment of refined luxury and elegance surrounds you. Highly polished burl elm graces the fascia, console and door waist rails. The seats are adorned with hand-tailored leather, accented by color-coordinated piping. Power-adjustable lumbar supports ensure comfort for even the lengthiest tours. Jaguar's 80-watt stereo system delivers near concert hall quality sound as it plays through four acoustically matched speakers.

Under the elegantly sloped hood lies Jaguar's overhead cam V-12 engine—as impressive for its smooth-

A B L E N D I N G O F A R T A N D

That High Performance Mutually Exclusive.



ness and refinement as for the 263 horsepower it generates. Modified for racing, it powered Jaguar to one-two victories in the world-famous 24-hour endurance races at Daytona and Le Mans this year.

Jaguar's four-wheel, fully independent suspension system provides a smooth, surefooted ride. And for confident stopping, even on slick surfaces, the XJ-S coupe is equipped with four-wheel disc brakes and a Teves advanced anti-lock (ABS) braking system.

In an era when exhilarating performance seems to preclude a tradition of luxury, the XJ-S coupe provides a most welcome exception.

We invite you to test drive the Jaguar XJ-S. For your nearest dealer, call 1-800-4-JAGUAR.

MACHINE JAGUAR

November 1990

Smithsonian

Volume 21, Number 8

Table of Contents

Cover: As a competitive kick-boxer, Bibendum (the Michelin Man) demonstrates his nonskid cleated treads in glass panel *Le Coup de la Semelle Bibendum*, designed in 1905 by the poster artist O'Galop, his originator (p. 138) Courtesy of Michelin, Clermont-Ferrand

12 *Smithsonian horizons* by Secretary Adams
18 *Letters to the Editor*
25 *Around the Mall and beyond* by Edwards Park
32 *Phenomena, comment and notes* by James Trefil

40 **Hard times on the American frontier**
In Nebraska's Sand Hills, wind pumps the water, cows chop the wood—and people are few and far between
By Donald Dale Jackson, photographs by Gail Mooney

54 **How Evelyn Cameron captured the plains**
Her quarry was eastern Montana, 1894-1928; her weapon a camera; and her trophy, a stunning pictorial record

64 **Titian: art's Venetian lion**
A bravura exhibition comes to the National Gallery to mark the quincentenary of the master painter's birth
By Bennett Schiff

84 **Micromachines—they're not to be sneezed at**
The future is big for tiny devices with microscopic parts that already measure blood pressure and save gas
By Doug Stewart, photographs by Peter Menzel

98 **Telling tales out of school**
On the coral reef, fishes sport eye-popping color combinations that get the word out to friend and foe
By Joseph S. Levine, photographs by Jeffrey L. Rotman

106 **Watch your language, cautioned H. W. Fowler**
For almost a century, the gentle lexicographer has steered scribblers through the shoals of English usage
By Israel Shenker, illustrations by John Huehnergarth

118 **India's gamble on the holy Narmada**
Debate rages as massive dams to harness the river's resources destroy forests, temples and homelands
By Mark Fineman, photographs by David Beatty

138 **It's high-low time at New York's MOMA**
"High" modernism meets the "low" arts of advertising, caricature, comics and graffiti in a lively new show
By Phil Patton

154 **George Bernard Shaw, in love and out**
At age 65, the dramatist fell for a young American vamp whom he would adore and revile, but never forget
By Arline B. Tehan

173 **Penicillin and a revolution in world health**
In the early 1940s, bacterial illnesses were a leading cause of death; then the first wonder drug was tried
By Edwin Kiester jr.

188 *Book reviews*
195 *Picture credits*
196 *Additional reading*
198 *November events at the Smithsonian*
204 *Smithsonian tours, seminars and expeditions*

206 **I'm all suited up, and a fireman for life**
By Bailey White

Smithsonian (ISSN 0037-7333) is published monthly by the Smithsonian Associates, 900 Jefferson Drive, Washington, DC 20560.
© Smithsonian Institution 1990. All rights reserved.
Reproduction in whole or in part without permission is prohibited.
Subscription price $20 a year in U.S. and possessions, $33 elsewhere. 80 percent of dues is designated for magazine subscription. Single copy price, $3. Second-class postage paid at Washington, DC and additional mailing offices.
Editorial offices at 900 Jefferson Drive, Washington, DC 20560.
Advertising and circulation offices at 420 Lexington Ave., New York, NY 10170.
Members: Please address all subscription correspondence and change of address information to Smithsonian, P.O. Box 55593, Boulder, CO 80322-5593.
Postmaster: Send address changes to Smithsonian, P.O. Box 55593, Boulder, CO 80302-5593.

Two thirds of the world is water. But it's not all like this.

Crystal clear waters, outrageously beautiful flowers, lush tropical greenery—they're all part of a vacation in the United States Virgin Islands. Just think—all this natural beauty surrounds luxurious resorts, historic towns, world-class dining and world-class shopping.
See your travel agent.

St.Croix St.John St.Thomas

The American paradise. United States Virgin Islands

© 1990 USVI Division of Tourism: Atlanta, Chicago, LA, Miami, NYC & D.C.

▲ PARIS ▲ DUBLIN ▲ SHANNON ▲ LONDON ▲ AMSTERDAM ▲

▲ PUERTO VALLARTA ▲ MAZATLAN ▲ GUADALAJARA

▲ IXTAPA ▲ ZIHUATANEJO ▲ MEXICO CITY ▲ ACAPULCO ▲ TO

How To Land Here.

Simply take off with Delta. We fly to Tokyo, Seoul, Taipei and Bangkok every day. To 27 international destinations on three continents, no airline goes farther to make you feel at home.

DELTA

We Love To Fly And It Shows.

©1990 Delta Air Lines, Inc.

URG ▲ FRANKFURT ▲ STUTTGART ▲ MUNICH ▲ BERMUDA ▲ NASSAU ▲ SAN JUAN ▲ VANCOUVER ▲ CALGARY

▲ SEOUL ▲ TAIPEI ▲ BANGKOK ▲ MONTREAL ▲ EDMONTON ▲

What To Pack.

You'll find the American Express® Card is all you need to reserve a front-row seat at sunsets like this one. Because wherever Delta takes you, American Express will take care of you.

AMERICAN EXPRESS®

Santa's Sleigh—A Bing & Grondahl Christmas Creation

With a major assist from loyal helpers, Santa saddles up with gifts for all the world. The charming and colorful art is the work of the Danish painter, Hans Henrik Hansen. Handsomely gift-boxed, production of the 8" plate is limited to the year of issue. Price: $59.50. Write or call Royal Copenhagen, 683 Madison Ave., NY NY 10021. Phone toll free (1) 800-223-1275. In NYS 212-759-6457.

A Soft Cowl-Neck Sweater At An Unbeatable Price!

In a special soft-as-cashmere acrylic yarn. Machine wash and dry. USA. Pale-peach, gold, red, heather-gray, lavender, pale-beige, pale-yellow, teal, off-white, nutmeg-brown, pale-mint, bright-olive, navy, deep-blue, black, spruce-green, light-blue, burnt-orange, wine, bright-purple, heather-beige or bright-cherry. 34,36,38,40,42. $19.95

Add $3.00 for shipping. ***Send for free catalog.*** *Order by mail, or phone 912-924-9371.*

THE TOG SHOP

310 Lester Square • Americus, GA 31710

Want to brush up on a foreign language?

With Audio-Forum's intermediate and advanced materials, it's easy to maintain and sharpen your foreign-language skills.

Besides intermediate and advanced audio-cassette courses—most developed for the U.S. State Dept.—we offer foreign-language mystery dramas, dialogs recorded in Paris, games, music, and many other helpful materials. And if you want to learn a new language, we have beginning courses for adults and for children.

We offer introductory and advanced materials in most of the world's languages: French, German, Spanish, Italian, Japanese, Mandarin, Greek, Russian, Portuguese, Korean, Swedish, etc. – 191 courses in 56 languages.

Call 1-800-225-5400 for FREE 36 page catalog, or write:

AUDIO-FORUM®

Room 2020, 96 Broad Street, Guilford, CT 06437 (203) 453-9794

Smithsonian

SECRETARY OF THE SMITHSONIAN INSTITUTION:
Robert McC. Adams

EDITOR:
Don Moser

BOARD OF EDITORS:
Constance A. Bond
Caroline Despard, Pictures
Jim Doherty
Timothy Foote
Marlane A. Liddell
Bennett Schiff
Nancy Seaman
Paul Trachtman
John P. Wiley jr.

ASSOCIATE EDITORS:
Diane M. Bolz
Kathleen M. Burke
Frances R. Glennon
Sally Scott Maran
Edgar Rich, Pictures
Jane D. Scholl

ASSISTANT EDITORS:
Suzanne Crawford
Judy Harkison
Bruce Hathaway
W. Eric Keller
Alison C. McLean
Lucinda Moore
Beth Py-Lieberman
Ruth Ravenel, Pictures

CONTRIBUTING EDITORS:
Ralph Backlund
Edwards Park

EDITORIAL ASSOCIATES:
Gloria Carr
Margot North

PUBLISHER:
Joseph J. Bonsignore
Mary D. Haskin, Assistant

ADVERTISING:
Thomas H. Black, Associate Publisher
Edward A. Daly, Manager
Robert F. Donovan, Associate Manager
Frederick T. Lyons, Eastern Manager

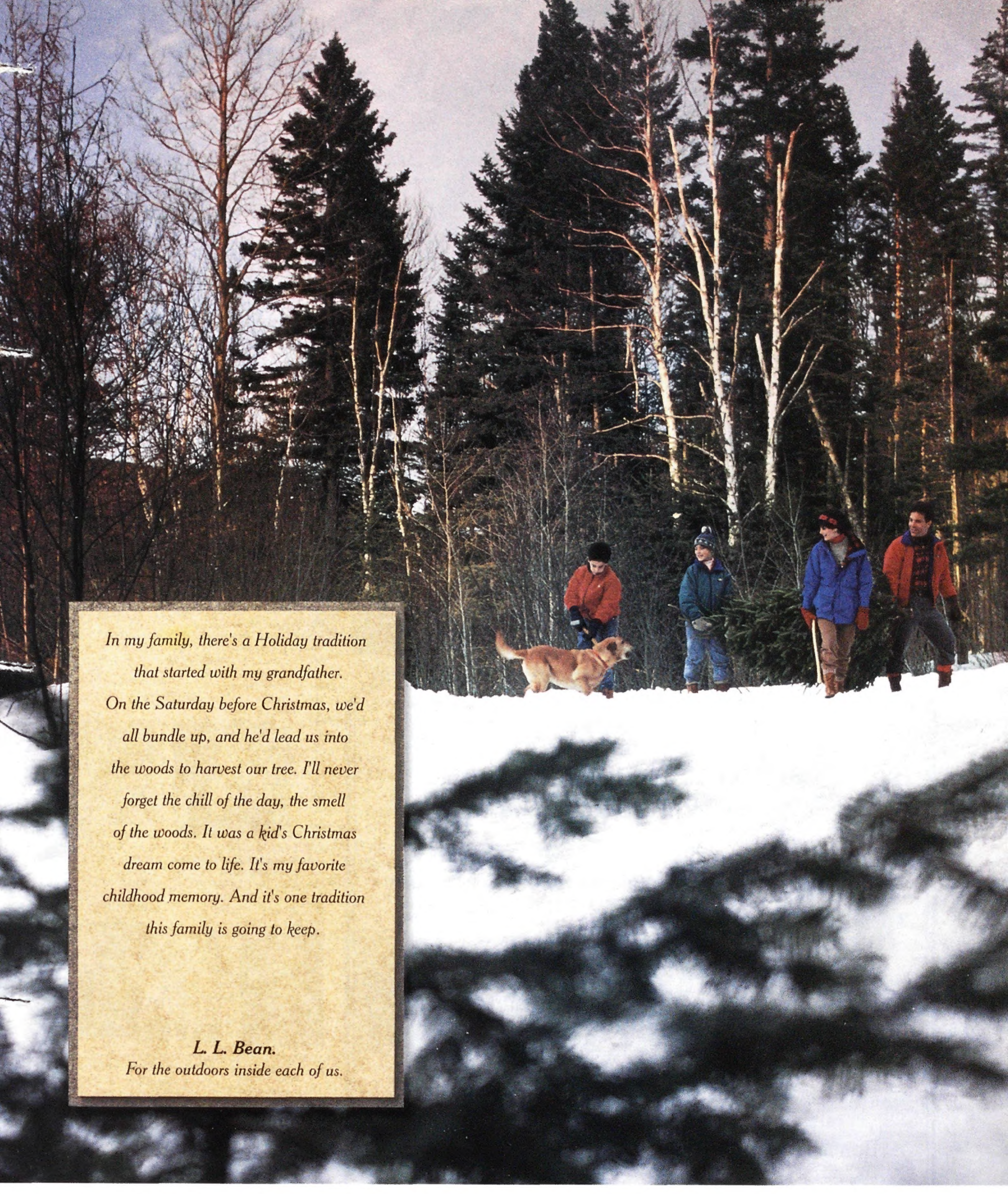
CIRCULATION:
John O'Donnell, Associate Publisher
Adeline Sherr, Director

ADMINISTRATION:
Carey O. Randall, Associate Publisher
Mary Ellen Bobb, Business Director
Valerie Martin, Business Manager

PRODUCTION:
E. Cherry Doyle, Director
Greg Williams, Quality Manager
Briggs S. Cunningham, Editorial
Suzanne Aldrich, Advertising

FOUNDER:
S. Dillon Ripley

EDITOR AND PUBLISHER EMERITUS:
Edward K. Thompson



In my family, there's a Holiday tradition that started with my grandfather. On the Saturday before Christmas, we'd all bundle up, and he'd lead us into the woods to harvest our tree. I'll never forget the chill of the day, the smell of the woods. It was a kid's Christmas dream come to life. It's my favorite childhood memory. And it's one tradition this family is going to keep.

L. L. Bean.
For the outdoors inside each of us.

For 78 years, L. L. Bean has offered durable, practical products for men and women who love the outdoors.
Our catalog includes active and casual apparel, footwear, equipment and accessories.
All fully guaranteed and honestly priced. If you'd like a copy, please call ***1-800-543-9071*** *anytime.*

L.L.Bean®
FREEPORT, MAINE

© L. L. Bean, 1990

Time out.

Here the silence deafens. Beauty and 5-Star, 5-Diamond service are unrelenting. Superb facilities overwhelm.

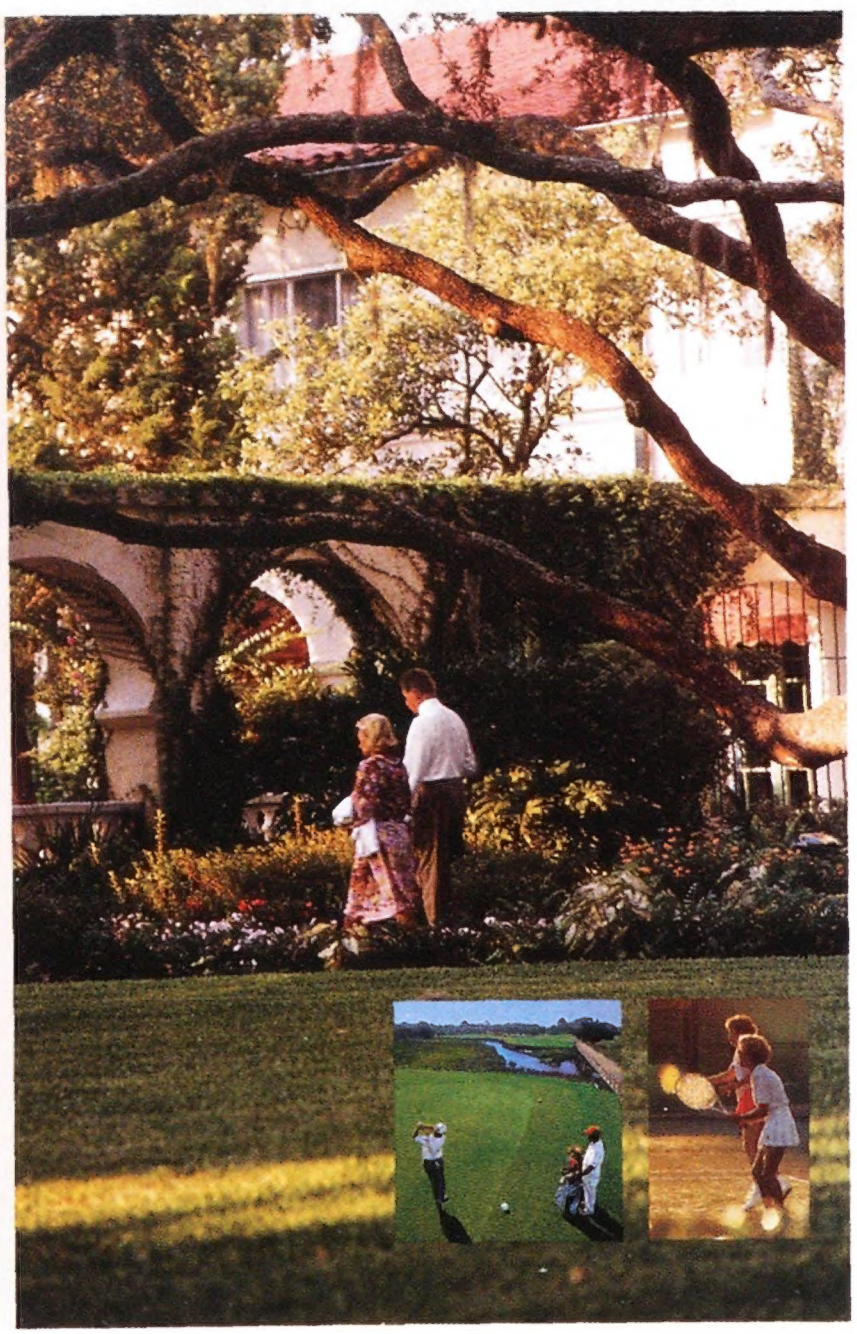
Time all but stops so perfect meetings can begin. At The Cloister, Sea Island.

Hailed by chief executives and meeting planners alike for attention to detail as much as championship golf, tennis, skeet, spa visits.

For meetings of the minds or personal visits—say the words. The Cloister, Sea Island, Georgia 31561. Call 800-SEA-ISLAND.

Sea Island®
THE CLOISTER

Home rentals: 912-638-5112



Smithsonian

Board of Regents
Smithsonian Institution

Ex Officio

Chief Justice of the United States
William H. Rehnquist, Chancellor
Vice President of the United States
J. Danforth Quayle

Appointed by the President of the Senate

Hon. E. J. (Jake) Garn
Hon. Daniel P. Moynihan
Hon. James R. Sasser

Appointed by the Speaker of the House

Hon. Silvio O. Conte
Hon. Norman Y. Mineta
Hon. Jamie L. Whitten

Appointed by Joint Resolution of Congress

Hon. David C. Acheson
Hon. Anne L. Armstrong
Dr. William G. Bowen
Mrs. Jeannine Smith Clark
Hon. A. Leon Higginbotham jr.
Mr. Samuel C. Johnson
Mr. Barnabas McHenry
Dr. Homer A. Neal
Hon. R. James Woolsey

National Board of the
Smithsonian Associates

Mrs. Gay F. Wray, Chairman
Mr. Philip F. Anschutz
Mrs. Robert M. Bass
Mr. George B. Bingham jr.
Mr. W. J. Bowen
Mr. Charles L. Brown
Mr. Dan Burns
Mr. Fletcher Byrom
Mrs. Cummins Catherwood jr.
Mr. Ivan Chermayeff
Mr. Jeffrey A. Cole
Mr. Thomas G. Cousins
Mrs. George C. Dillon
Mr. Peter E. Haas
Mr. John M. Harbert III
Mr. Gerald D. Hines
Mr. Frank W. Hoch
Mr. S. Charles Kemp
Mr. Thomas M. Keresey
Mr. Robert V. Lindsay
Mrs. Bruce K. MacLaury
Mr. Alexander K. McLanahan
Mr. Antony Merck
Mrs. Anne Murray Morgan
Mr. John W. Morrison
Dr. George E. Mueller
Mr. Jack S. Parker
Mr. Thomas J. Pritzker
Mr. Alvin N. Puryear
Mrs. Arthur M. Sackler
Mr. Leveo V. Sanchez
Mr. Lloyd G. Schermer
Mr. Charles W. Schmidt
Dr. Ivan Selin
Mrs. E. Maynard Smith
Mr. A. Alfred Taubman
Mrs. James M. Walton
Hon. John C. Whitehead
Mr. T. Evans Wyckoff

Honorary Members

Mr. William S. Anderson
Mr. Richard P. Cooley
Mr. Joseph F. Cullman III
Mr. Charles D. Dickey jr.
Hon. Leonard K. Firestone
Mr. Alfred C. Glassell jr.
Mr. W. L. Hadley Griffin
Hon. William A. Hewitt
Mr. James M. Kemper jr.
Mr. Seymour H. Knox III
Mr. Lewis A. Lapham
Hon. George C. McGhee
Justice Sandra D. O'Connor
Mr. S. Dillon Ripley
Mr. Francis C. Rooney jr.
Hon. Thomas J. Watson jr.

Save $20.50 and treat your family to a genuine

HARRINGTON'S

Vermont Smoked Ham —now only $22.95!

★★★

Order yours now!

Special Introductory Offer

Regular price $43.45, now only $22.95

All offers good to 48 states only.
Limit 1 each product.
Expires 12/28/90

. . . and for TURKEY LOVERS:

"You won't find a better-tasting ham than the old-fashioned Corncob Smoked Ham I make for Harrington's up here in Vermont. You'll love it—and that's my promise or your money back!" Vern Richburg, SmokeMaster

Cob Smoked Boneless Turkey Breast

Tender, moist, smoky-delicious – and 100% white meat with *no* fillers. Fully cooked 2½ lb. Boneless Turkey Breast now only $18.95, a $6.50 savings.

FREE! Order *both* our Smoked Ham *and* Boneless Turkey Breast (shipped to same address) and we'll include 6 oz. of our special Aged Cheddar and ½ lb. Cob Smoked Bacon-free!

HARRINGTON'S

185 Main Street, Richmond VT 05477

☐ 121-021 Ready-to-Cook Half Ham (6 lbs.) $22.95
☐ 206-006 Boneless Turkey Breast (2½ lbs.) $18.95
☐ 123-023 BOTH Ham and Turkey Breast to same address $41.90. Include 6 oz. Aged Cheddar & ½lb. Bacon FREE
Add $4.50 P&H for each shipping address

Name _____

Address _____

_____ Zip _____

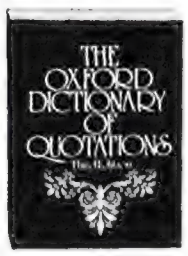
☐ Payment enclosed. ☐ Charge my ( )Visa ( ) MC ( ) AMEX ( ) Diner's acct. (Include card no. and exp. date, plus your name and address if different from shipping address above.)

RUSH Orders: (802) 434-4444

QPB. The Book Club for People Who Are Tempted by a Great Offer.

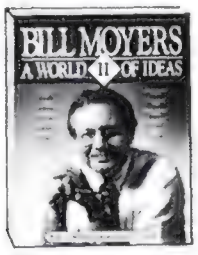
212. Three works by Annie Dillard: *Pilgrim at Tinker Creek, An American Childhood* and *The Writing Life.*

(3-in-1 vol.)
QPB: $11.95



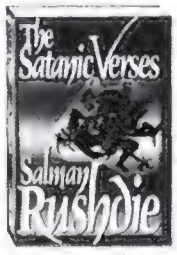
*482. This latest edition of the famous dictionary has 40,000 memorable quotations.

Hardcover: $45
QPB: $18.95



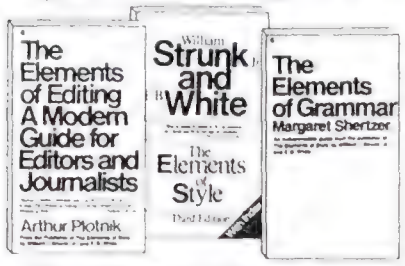
180. More fascinating interviews with opinion-makers, from the groundbreaking PBS series.

Hardcover: $35
QPB: $16.95



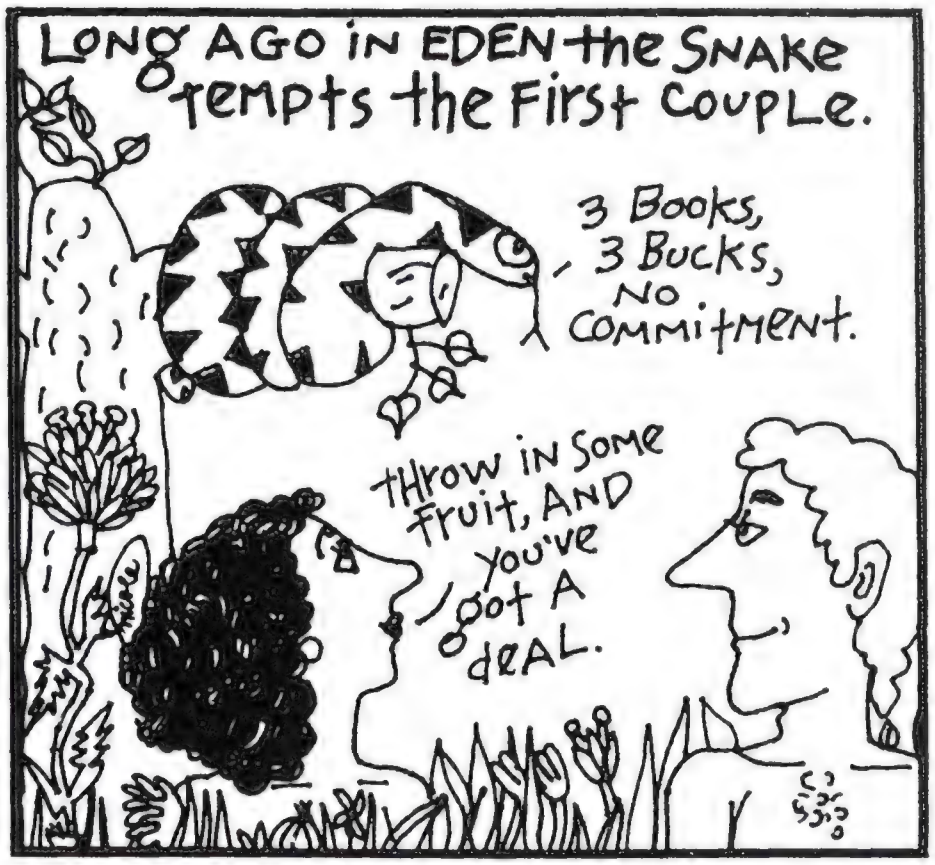
*406. "A roller-coaster ride over a vast landscape of the imagination" —London *Guardian.*

Hardcover: $19.95
QPB: $9.95



109. *The Elements of Style* discusses what good writing is; *The Elements of Grammar* gives the rules to follow; *The Elements of Editing* describes what's said best—and what's best left unsaid.

(3-volume set)
QPB: $10.95

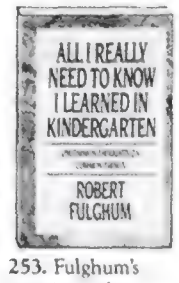


3 books, 3 bucks. No commitment. No kidding.

For people who love to read, QPB is paradise. Just choose 3 books from this page for only $3, plus shipping and handling, and you never have to buy another book from us again.

And that's just the genesis of what you get as a QPB member. About every 3½ weeks (15 times a year), you'll receive the *QPB Review,* which includes all our latest offerings—a tempting array of fiction, history, biography, science, humor and much more. All published in high-quality QPB softcover editions at prices up to 60% less than hardcovers. And every time you buy a QPB book, after this introductory offer, you'll receive Bonus Points that you can trade for free books—you pay just shipping and handling.

How can you resist? Join QPB today and you'll see that giving in to temptation can deliver you from overpriced books.

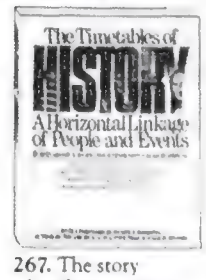


253. Fulghum's premise is that we learned the important lessons by age 5: "Play fair; Flush...."

Hardcover: $15.95
QPB: $7.95

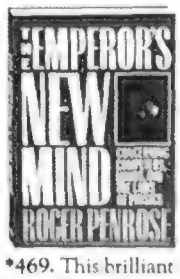
*417. The ultimate one-volume collection of the world's most-sought-after information.

Hardcover: $29.95
QPB: $14.95



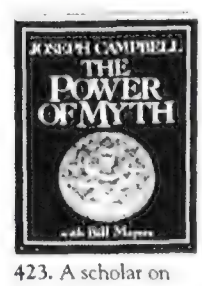
267. The story of civilization in a unique chart format.

Hardcover: $29.95
QPB: $15.95



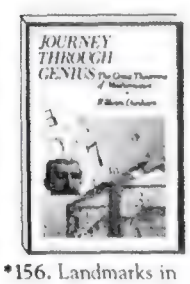
*469. This brilliant best seller explores the question: Can computers think?

Hardcover: $24.95
QPB: $12.95



423. A scholar on mythology tells how myths have shaped our lives.

Hardcover: $27.50
QPB: $15.95



*156. Landmarks in mathematics seen through the lenses of history, science and an aesthetic sensibility.

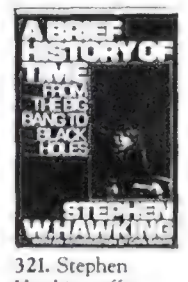
Hardcover: $19.95
QPB: $10.95

*117. Over 1600 problem-solving drawings with explanations on every aspect of home repair.

Hardcover: $24.95
QPB: $12.95

223. Imagine da Vinci using puppies for paint brushes and you've got Larson's new Far Side book.

QPB: $6.95

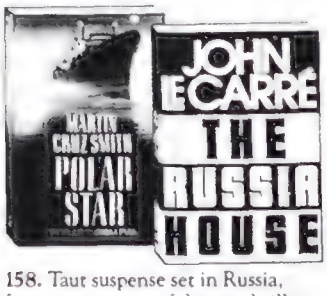


321. Stephen Hawking offers a convincing big picture of the origins of the cosmos.

Hardcover: $18.95
QPB: $8.95

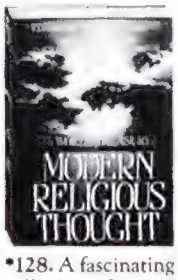
101. A masterly historical appraisal of the most significant events and battles of WW II.

Hardcover: $29.95
QPB: $14.95



158. Taut suspense set in Russia, from two masters of the spy thriller.

(2-volume set)
Hardcovers: $39.90
QPB: $15.95



*128. A fascinating collection of modern religious, contemplative and inspirational writing.

Hardcover: $29.95
QPB: $14.95

457. A rich collection of North American Indian folklore.

Hardcover: $19.95
QPB: $10.95

*QPB Exclusive: The only softcover edition now available.

How QPB Membership Works.

Selection: Each *QPB Review* lists a new Selection. If you want it, do nothing—it will be shipped automatically. If you want another book or no book at all, complete the Reply Form always enclosed and return it by the specified date. (A shipping and handling charge is added to each shipment.)

Return Privilege: If the *QPB Review* is delayed and you receive the Selection without having had 10 days to notify us, you may return it for credit.

Cancellations: You may cancel membership at any time by notifying QPB. We may cancel your membership if you elect not to buy at least one book in any six-month period.

I'm giving in to temptation. Send me my 3 books for $3.

Quality Paperback Book Club,® P.O. Box 8804, Camp Hill, PA 17011-8804

Please enroll me in QPB and send me the 3 choices I've listed below, billing me only $1 each, plus shipping and handling charges. I understand that I am not required to buy another book. You will send me the *QPB Review* (if my account is in good standing) for at least six months. If I have not bought at least one book in any six-month period, you may cancel my membership.

0-16
[ ] [ ] [ ] *Indicate by number your 3 choices*

Name *(Please print clearly)* QB454-11-0

Address Apt.

City State Zip

Quality Paperback Book Club

Prices are generally higher in Canada. © 1990 Quality Paperback Book Club. All orders subject to approval.

THE GUPPY HAS a rather unique way of handling the problems of parenthood.

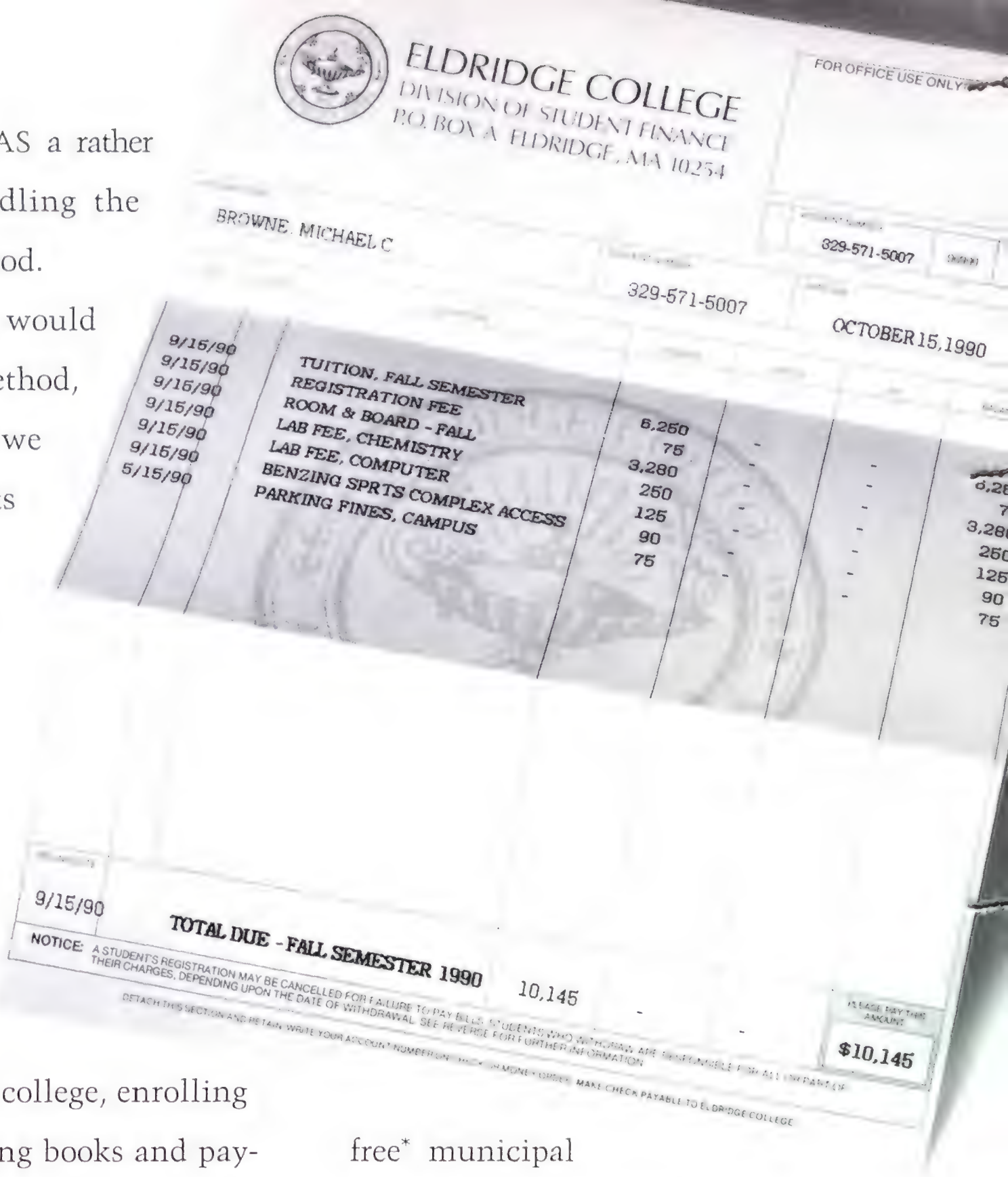
And while we would never adopt this method, there are times when we can't help admiring its simplicity. Like when we're faced with the prospect of planning for a child's education.

For as young as your little one may be, it won't be long before the little beezer is off to college, enrolling in Rhetoric 101, buying books and paying lab fees. (Not to mention making a request or two for spending money.)

Of course, there are a number of ways to handle this impending financial dilemma, but none, perhaps, more comforting than the College Investment Program from John Nuveen & Company.

Nuveen deals exclusively in tax-free* municipal bonds. So we can offer investors the relative security of a conservative portfolio (particularly relevant for something as important as your child's future), as well as tax-free income (so more of the money you earn goes towards your child's education).

Yet, it isn't just the tax-free nature


ELDRIDGE COLLEGE
DIVISION OF STUDENT FINANCE
P.O. BOX A ELDRIDGE, MA 10254

FOR OFFICE USE ONLY

BROWNE, MICHAEL C — 329-571-5007 — 329-571-5007

OCTOBER 15, 1990

9/15/90	TUITION, FALL SEMESTER	6,250	-	-	6,250
9/15/90	REGISTRATION FEE	75	-	-	75
9/15/90	ROOM & BOARD - FALL	3,280	-	-	3,280
9/15/90	LAB FEE, CHEMISTRY	250	-	-	250
9/15/90	LAB FEE, COMPUTER	125	-	-	125
9/15/90	BENZING SPRTS COMPLEX ACCESS	90	-	-	90
5/15/90	PARKING FINES, CAMPUS	75	-	-	75
9/15/90	TOTAL DUE - FALL SEMESTER 1990	10,145			

NOTICE: A STUDENT'S REGISTRATION MAY BE CANCELLED FOR FAILURE TO PAY BILLS. STUDENTS WHO WITHDRAW ARE RESPONSIBLE FOR ALL OR PART OF THEIR CHARGES, DEPENDING UPON THE DATE OF WITHDRAWAL. SEE REVERSE FOR FURTHER INFORMATION.

DETACH THIS SECTION AND RETAIN. WRITE YOUR ACCOUNT NUMBER ON YOUR CHECK OR MONEY ORDER. MAKE CHECK PAYABLE TO ELDRIDGE COLLEGE

PLEASE PAY THIS AMOUNT

$10,145

of the bonds that makes Nuveen investments so ideally suited to college funding. It has more to do with the way we select them.

NOW we know *why* GUPPIES *eat their young.*

We start by reviewing billions of dollars worth of municipal bonds each year. Only then do we finally invest in a select few (including some that other investment firms have overlooked).

The performance of these bonds is then scrupulously monitored over the long-term, with one goal in mind: to provide a high level of tax-free income over time, while still protecting our client's initial investment.

And should you decide to choose Nuveen for your child's college fund, you'll find your choice isn't limited to a particular University. (What if your child doesn't want to attend your *old alma mater?*) And the money that you invest with Nuveen is always yours to do with as you wish. In fact, you don't even have to use it for college.

To find out more about the ways you can finance your child's future without mortgaging your own, ask your personal banker, broker or financial adviser about the Nuveen Tax-Free College Investment Program.

For more complete information on Nuveen tax-free open end mutual funds or unit trusts, including charges and expenses, call for a prospectus. Read it carefully before you invest or send money.

**Income may be subject to state and local taxes. Capital gains, if any, will be subject to capital gains taxes.*

NUVEEN

Specialists In Tax-Free Investments Since 1898.

A FREE OPPORTUNITY FOR PARENTS TO BECOME COLLEGE EDUCATED.

Have you wondered what tuition fees will be like 5, 10 or even 50 years from now? Then call us toll-free at 1-800-524-6500. We'll prepare a personalized tuition projection that will illustrate the cost of sending your child to any four year college in the country. And we'll send it to you free of charge.

Secretary Adams' comments

Smithsonian horizons

The range and fertility of development in modern biology is extraordinary, but funding for research is a problem

Anyone who tries to keep abreast of current developments in science, even if only as unavailingly as I do, cannot help being aware of the extraordinary range and fertility of developments in modern biology. The dominant place that articles on cellular and molecular biology have come to occupy in the major journals reporting on research across the entire spectrum of the sciences, such as *Science* and *Nature*, amply testifies to the accelerating pace of discovery.

Most of those reports are, to be sure, necessarily narrow in focus and highly technical in detail. To identify the significant trends, unsolved puzzles and multiplying cross-linkages, we biological onlookers badly need an authoritative guidebook.

My own needs have been admirably met by one such work that has recently appeared under the auspices of the National Academy of Sciences, *Opportunities in Biology*. With an interest in the historic intertwining of the paths of science and technology, I have found especially rewarding the frequency with which innovative instrumentation and methods promoting the discovery process are described.

Nature, while acknowledging that this report is "indeed well suited for setting a little knowledge, or a patchy knowledge, in a broader framework," took jaundiced note of other respects in which this Academy publication seemed to have missed an opportunity. It is late in the day, *Nature*'s editor maintained, to celebrate the substance of a scientific revolution so voluminously and enthusiastically without taking greater note of its multiplying external impediments.

That may be so. Agitation for the rights of laboratory animals, opposition to fetal research, legal attempts to block practical applications of biotechnology, media preoccupation with rare cases of scientific fraud (or even mere error), a general encroachment by regulatory entanglements, and efforts to force a reduction in university commitments to graduate research alongside education, all point in this direction. These are still only scattered clusterings of opposition, largely activated by particular principles or fears. But skepticism of all things is becoming pervasive, and a growing public preoccupation with many other conflicting needs and priorities is certainly understandable.

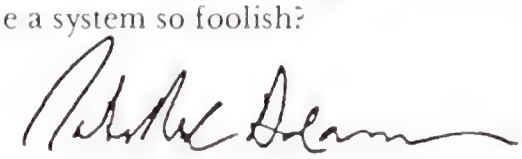
The Academy report duly comments on what may be some secondary, internal consequences of these and other developments. Industry, for example, now vigorously contributes to basic research and competes for the best available talent. Heightening the challenge for the universities, the proportion of "A" high school students intending to major in biology has dropped by almost half, and the supply of entering graduate students has leveled off if not declined. Shortages of trained biologists to exploit some of the recent breakthroughs are likely to plague us before the end of the century. But the more urgent problems involve funding for research. Leon E. Rosenberg, dean of the Yale University School of Medicine, is among many who, primarily on these grounds, have spoken of our whole biomedical research program as "burning." And, Rosenberg warns, "the conflagration is spreading."

Today our annual expenditures for health care are unmatched in the world—$600 billion, more than 11 percent of the gross national product. Yet one in seven Americans is without health insurance, nurses are in critically short supply in some cities, urban emergency-room care is radically deteriorating or disappearing, and some hospitals face bankruptcy. The fraying of the social safety net, the drug and AIDS epidemics, costly defensive medicine (under threat of malpractice lawsuits), an aging population, ballooning investments in the latest medical technology in order to compete for the dwindling number of adequately insured patients, and a system notably lacking in effective cost-control measures—all have contributed to this shambles.

Health-related research, which is largely funded through the National Institutes of Health, traditionally has managed, for obvious reasons, to provide a powerful underpinning of moral (and to some extent material) support for research in basic biology. Federal, foundation and corporate support for the health sciences has grown steadily, although as a proportion of total health expenditures it has sharply declined. Virtually all young biomedical investigators now face discouraging odds in getting started, and laboratory facilities are slipping into obsolescence.

This is where *Nature*'s criticism really bites, although it has little to do with the scientific opportunities the report seeks to sketch.

Prospects for a fundamental advance toward an understanding of the living world, and with it human health, were never greater or more realistic. Yet our investment in that objective has slipped to 3 percent of our health care bill, even as the latter continues to rise uncontrollably. Meanwhile, for a significant part of our population, the quality of the health care system accessible to them continues to deteriorate. Each of these trends involves tragic waste and human suffering. How long will we tolerate a system so foolish?

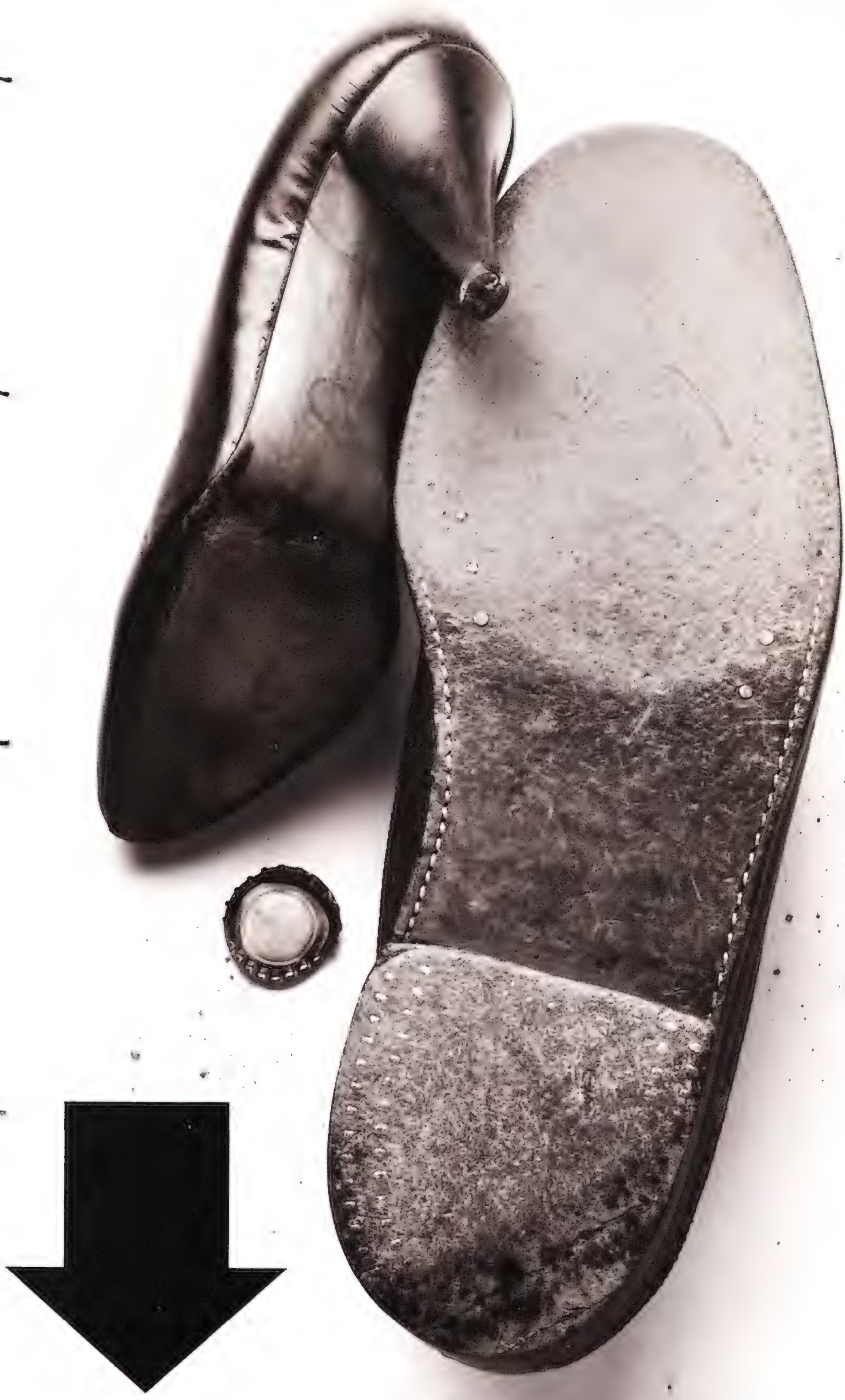


The concert season at 930 Morningstar Lane will feature Steve Allen, George Shearing, Peter Nero and the Yamaha® Disklavier™ piano.

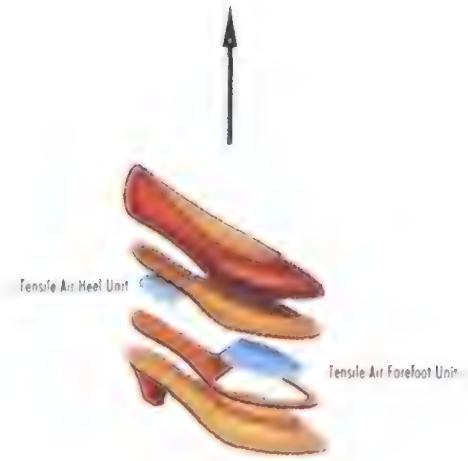
Of course, the artists won't appear at the Henderson residence in person, but the performances will be extraordinarily live just the same...with PianoSoft™ pre-recorded disks and the Disklavier™ piano. ■ *Listening Series* disks reproduce every nuance of the artist's original performance when played back on the Disklavier.™ ■ So, if you're not invited to the Henderson's concert series, audition the PianoSoft™ library and the Disklavier™ piano at your authorized Yamaha piano dealer and begin planning your own star-studded concert season.

YAMAHA® disklavier™ PIANO

© 1990 Yamaha Corporation of America, Keyboard Division, P.O. Box 6600, Buena Park, CA 90622



[Gravity] *It's what's wrong with every pair of shoes you've ever owned.*



Most people are content
making shoes that
fit feet, but we make shoes
that also fit the planet.
Shoes that fight gravity
where it lives.
Shoes with Tensile Air™
units from Nike. Basically,
we took everything we
learned from making
athletic shoes and squeezed
it down to an
eighth of an inch so it fits
beautifully into
shoes by Cole Haan. You
can't see Tensile Air,
but you'll know it's there.
Unfortunately, the
same can be said of gravity.

[Tensile Air™
available only in the
Cole Haan Tensile Air
Collection]

Introducing [Tensile Air™] *Defy gravity.*
created by Nike

TENSILE AIR

CREATED BY NIKE

NEVER BEFORE has pure gold been added to the most beautiful United States minted coins – the **Morgan Silver Dollar** and the **Walking Liberty Half Dollar.**

Our exclusive bi-tone process adds 24k gold with extreme precision to create a stunning two-tone of precious metals. Our Lenscote II process permanently seals and protects the beauty of these authentic coins. These quality silver and gold coins are fashioned by and only available through CartWheels

The **Walking Liberty Necklace,** complete with a 14k gold-filled 24" rope chain, is $139. If possible, we would like to send you a meaningful date between 1936 and 1947

The **Morgan Silver Dollar Clip** is heavy 24k gold-plated with a patented spring action clip that will hold even one bill firmly. Choose either the Eagle or Face side of the coin. Free initials on the clip back. The clip is $99 or $104 for coins over 100 years old

A numbered Certificate of Authenticity comes with each coin and all are beautifully gift-wrapped. If on receipt you are not fully satisfied, we guarantee a refund. Prices subject to change

CartWheels
6160 N. Cicero Ave.
Chicago, IL 60646

Order TOLL FREE
24 HOURS – 7 DAYS
1-800-441-7666

Please send		Price ea.	Quantity
Necklace–	Walking Liberty **W** Date(s) _____	$139	_____
Money Clips –	Morgan Eagle **ME**	$ 99	_____
	Morgan Face **MF**	$ 99	_____
	Morgan Eagle, 100 yr. old **ME-1**	$104	_____
	Morgan Face, 100 yr. old MF-1	$104	_____
FREE INITIALS	1ST CLIP ☐☐☐	2ND CLIP ☐☐☐	

Add $3 Shpg/hdlg, $5 for 2nd day, or First Class, $14 overnight. All orders insured. Illinois res. add 8% sales tax
☐Check enclosed ☐Charge AX, VISA, MC TOTAL $ _____

Card No. _____ Exp. Date _____

Name _____

Address _____

City/State/Zip _____

Letters to the Editor

Bureau of Land Management

Dear Sir: Commenting on your September article, cattlemen graze until the land is demolished. They blame the wild grazers, the caretakers or the weather. They should look to their own doorsteps.

I am a retired cattleman. After service in World War II, I purchased a stock ranch that was so overgrazed it would support only 40 to 50 pairs of cattle. Hay had to be purchased. Twenty years later the same land was supporting 300 to 400 pairs and furnishing the hay needed for feed. This change was accomplished by simply working with the land. A third of the range was taken out of spring grazing every third season. Cows came off-range at fall roundup in top shape; the payoff was the increased weaning weight of calves. The range also carried a heavy load of game animals, and creek fishing remained tops.

It is good that overseers of the BLM and some ranchers are using a new approach. As to the owners of bikes and off-road vehicles, let them buy a tract of land to play on. Then they would learn how fragile the land can be.
E. Brosten
Potlatch, Idaho

Dear Sir: What about the thousands of jobs, millions of dollars in products, and local economies dependent upon BLM lands? Wholesale destruction is *not* what is happening. For the most part, BLM lands are well managed by professional foresters, geologists, biologists and archaeologists.
H. James Holmes
Korbel, California

Dear Sir: The cost of administering grazing permits exceeds the revenue. At $1.81 per AUM, it would be more cost-effective to pay the permittees to stay off the national resource lands than to let domestic livestock grazing continue to destroy them.
Herbert Snyder
National Council of Public Land Users
Grand Junction, Colorado

Dear Sir: Fragile riparian areas must be protected. Those Western Congressmen who are intimately connected with mining and grazing interests will not act. Demand for reform must come from other parts of the country, and will do so only if voters ask how their representatives or the challengers will vote on environmental reform, before the November elections. Our children's future depends on it.
Richard Henry
Ridgecrest, California

Starlings

Dear Sir: In Shakespeare's *Henry IV, Part One*, young rebel Henry Percy, nicknamed Hotspur, is furious with King Henry for his refusal to ransom Edmund Mortimer, Hotspur's brother-in-law and ally, captured in battle by the Welsh. Hotspur tells his father and uncle that he will find the king when he is sleeping: "And in his ear I'll hollo 'Mortimer!'/Nay, I'll have a starling shall be taught to speak/Nothing but 'Mortimer', and give it him. . . ."

Because of this one reference, *Sturnus vulgaris* is now found all across America.
Earl L. Dachslager
The Woodlands, Texas

Dear Sir: Over a year ago we rescued a baby starling from neighborhood cats. We hand-fed him and he now has a flight cage on our back porch.

Goony Bird is always making us laugh. He has taught himself to do backflips and can say, "Who's a pretty bird?" (not everyone finds starlings ugly), "It's a mess," "Night-night" and several other phrases. What he delights in most is whistling the whole theme song from the old *Andy Griffith Show.*

His habits are much the same as those of his relative, the mynah. He loves to bathe but does not like a clean cage, and works hard to mess it up. He throws food about and drops things through his cage bars onto our two dogs, annoying them no end. His favorite foods are tofu (maybe it tastes like mashed-up worms?) and fresh basil.

Starlings aren't for everyone, but they are lovable, happy, hardy, entertaining show-offs—in short, nature's clowns.
D. Berger
LaVerne, California

Dear Sir: I've spent most of my adult life plucking, poisoning and stomping European brown snails in my garden, but nothing seemed to eliminate the slimy nuisances. One day I saw a flock of starlings patrolling my cement block wall that overflows with Algerian ivy. The birds were peering into the drainage joints in the bottom course of blocks, jumping up to peck at the overhanging bricks atop the wall and shouldering their way into the leafy verge of ivy.

Their quest, I learned, was brown snails. The ground below the wall was littered with shattered snail shells.
H. W. Bayles
Escondido, California

Dear Sir: I also looked upon starlings with their "oil-slick" plumage and unfriendly eye as "trashy" birds, until a couple of years ago. Then I witnessed the most amazing behavior I have ever observed in the avian world. I watched while a starling meticulously preened, occasionally picking up a small white object to carefully rub over its entire body. It was a mothball my neighbor had placed in her flower bed to keep squirrels away from her bulbs! How a lowly starling divined the properties of naphthalene is beyond me.
Mary King Lyon
Ellicott City, Maryland

Dear Sir: I did not find this article the least bit amusing. A naturalist for 16 years, I despair of attempts to place such human attributes on animals as "bullies" and "lowlifes," perpetuating the idea that we can divide them into good and bad. Animals are neither—they just ARE.

If nonnatives *do* create havoc in the natural scheme of things, we should not be so selective in our condemnation. Starlings are hated, while the ring-necked pheasant, a brood parasite on native prairie chickens, is rarely recognized as an alien, much less condemned!
Karen Kobey
Coon Rapids, Minnesota

Dear Sir: The starling population could be reduced by designating them game birds. Hunters would help control their numbers. In Europe, they are eaten—the "Four and twenty blackbirds" in the pie may have been starlings.
Leonard J. Garigliano
Parsonsberg, Maryland

Joseph Wright

Dear Sir: This disgruntled Savoyard would like to point out that the quotation "For he might have been a Roosian, a French or Turk or Proosian" rather than being from the *Pirates of Penzance*, was sung by the boatswain in Act 2 of *HMS Pinafore*.
Samuel I. Omansky
Sun City Center, Florida

Dear Sir: On page 50 you state that Wright died in 1789 at age 62; on page 58: "Wright continued to paint until about 1796 or '97." This should recommend him to the study of not only art historians, but of all medical science.
Wayde Killmeyer
College Park, Maryland

THINK OF IT AS
A SPORTS CAR WITH
EXTRA PICK-UP.
CALL TOLL FREE FOR YOUR CATALOG OF 1990 VOLVOS 1-800-221-9136
© 1990 VOLVO NORTH AMERICA CORPORATION
THE TURBO WAGON BY VOLVO

The perfect gift . . .

A **Maine Holiday Wreath** for you, your loved ones or as a business gift. Beautifully handcrafted of freshly cut fragrant balsam fir boughs, pine cones, red apples and a weatherproof red velveteen ribbon. About 22" diameter. Order early. Price **$27.95** (within the 48 USA) includes UPS delivery and an optional gift card. Business quantity prices available. Guaranteed. Telephone orders call: **1 800 776-8778,** FAX 207 667-8315. For order service and information: 207 667-5561 MasterCard, VISA, M.O. or check accepted

Card No. _____ Exp. Date _____
Send to
Mr/Mrs _____
Address _____
City _____ St. ____ Zip ____
( ) Enclose a gift card signed _____

Maine Holiday Wreaths
P. O. Box 536 - S Ellsworth, ME 04605

Oscar does the hard part so you can save thousands!

Bartley craftsmen make it possible for you to save thousands on museum quality furniture reproductions. All you do is assemble and finish their precision-cut-pieces. No special tools required! FREE FULL COLOR CATALOG!

The Bartley Collection LIMITED

1-800-BARTLEY
1 800 227 8539

Dept. 4615, 3 Airpark Drive, Easton, MD 21601
Showrooms: Easton, MD & Yarmouth, ME

Joseph Wright died at age 62—in 1797. We regret having lofted him into the spirit world with a date of 1789. Ed.

Object at hand

Dear Sir: If visitors to the wine country of Sonoma County will stop by the campus of Analy High School in Sebastopol, they will be treated to the rare experience of seeing all three species of redwood growing side by side [below].

They were planted together in 1972, so have been subject to identical conditions. Growth differences can be attributed to the trees themselves. A time capsule was buried among their roots.

The coast redwood ended up with a double trunk, the dawn is branching to intertwine with its neighbors, and the giant redwood from the mountains is already a monster compared with the other two, clearly showing what it intends to be when it grows up—in a thousand years or so.
Donald Clark
Santa Rosa, California

Science Fair

Dear Sir: In May I was privileged to attend the International Science and Engineering Fair in Tulsa. My research project, one of 90 in "environmental sciences," was conducted over a two-year period. I had collected information on water pollution and its effects on organisms for three years before that. I received a cash award of $250 from the North American Benthological Society and went home to West Virginia a winner.

But there are other reasons I was a winner: meeting many wonderful new people, starting new friendships, having the opportunity to enrich my mind with my colleagues' efforts. Most of all, I was introduced to the rewards of hard work. Not everyone received a cash award, but everyone truly went home a winner.
Karaleah Jones, age 15
Kearneysville, West Virginia

Dear Sir: I would like to correct one impression given by this article. The International Science and Engineering Fair had 13 disciplinary categories this year in which students could compete, with from 23 to 90 entries. It is not easier to win in a small category as Noah Mittlefehldt thought. The number of awards in a category is increased as the number of entries increases.
E. G. Sherburne jr.
President, Science Service
Washington, D.C.

Dear Sir: I am the mother of five former junior high Science Fair participants. Mr. Lindahl, our seventh- and eighth-grade science teacher, was a devotee.

For weeks prior to deadline our children tossed project themes out for family consideration. When the decision was made, plans began. Miniature models of solar-heated houses, farms that practiced wind and water and soil conservation, and models displaying the functions of body organs took shape in sketches and constructions. Getting the project completed meant involving the entire family in finding materials.

The benefits of Science Fair to all of Mr. Lindahl's students in our small, rural school are immeasurable and of lifelong value, but I also admit that eighth-grade graduation for each child

Analy High's redwoods are, from left: coast, dawn, giant.

was cause for a dual celebration: moving into high school—and one more who had completed Science Fair.
Clara Belden
Sterling, Kansas

Billboard artists

Dear Sir: Twitchell may rightfully use the title "artist"; at least he creates. The rest should precede "artist" with "hack." They are sign painters or copyists.

Peter Blake's rightful condemnation of the billboard industry in *God's Own Junkyard* quotes Senator Robert Kerr as referring to its "ass-thetic" accomplishments. This article makes Kerr's description seem prophetic.
Philip F. Jaggers
Wickenburg, Arizona

Dear Sir: You have done a whitewash of a dirty industry in portraying the billboard as upscale art. It is an intrusive medium that blights our neighborhoods, degrades our landscape, mars scenic beauty and lowers property values.

Unlike ads that can be eliminated at the flip of a switch or the turn of a page, there is no way to turn off a billboard. We are a captive audience to a drive through the Yellow Pages.
Edward T. McMahon, President
Scenic America
Washington, D.C.

Annie Oakley

Dear Sir: You recalled my happy childhood days in Pinehurst, North Carolina.

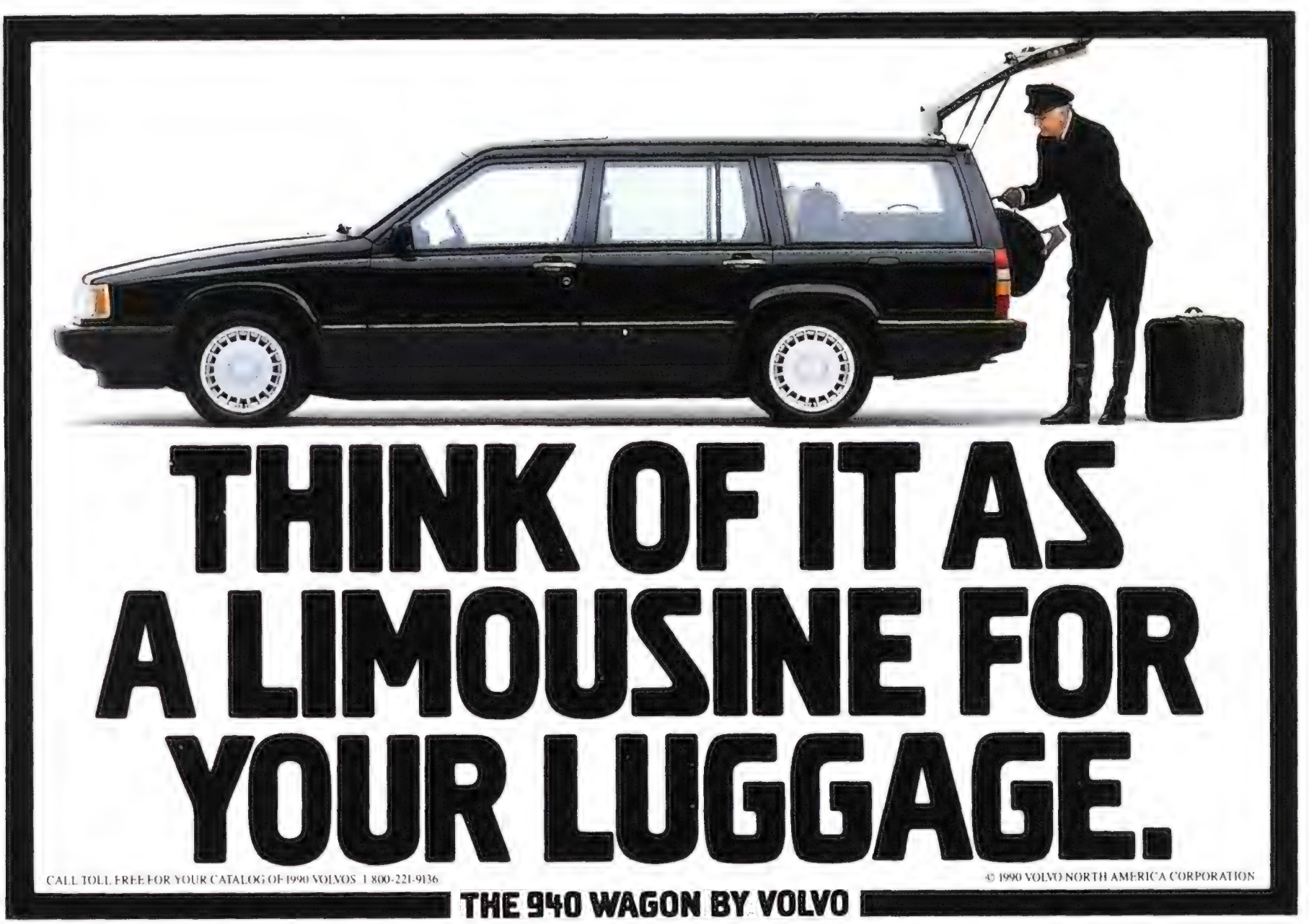
The Pinehurst Gun Club was a very active spot, especially when Annie Oakley and her husband, Frank Butler, were there. In the 1920s, after Annie's retirement from show business, she taught several of us children to shoot, and I won a number of gold rifle pins.

Just as Annie outshot her husband-to-be, I outshot my husband before we were married in 1942, although he was the best marksman in his regiment.
Frances Johnston Markle
Ardmore, Pennsylvania

Dear Sir: In 1912 or 1913 my father took me to see Annie Oakley's last touring show, "The Young Buffalo Wild West," in Herrin, Illinois. In her final stunt her assistant, probably Frank Butler, tossed her loaded rifles with full magazines. She emptied each one at a sheet of tin, firing as fast as she could pull the trigger and recock the rifle, spelling out her name in bullet holes. While the audience applauded wildly, she took a bow, then grabbed the rifle and fired backward, dotting the "i." That brought down the house.

It was her name-spelling act, not the playing-card shoot, that gave the name "Annie Oakleys" to complimentary tickets. The theater's name, spelled out in tiny perforations like the bullet holes Annie shot into the tin sheet, made counterfeiting of comps more difficult. As a reporter on the *Chicago Tribune* in the 1920s, I got many an Annie Oakley from the theater critics, and all were perforated in that manner.
Roe Fowler
Fresno, California

Dear Sir: Annie couldn't have supplied Ohio pheasants to hotel dining rooms in Cincinnati in her early teens. Ring-necked pheasants were first released in Ohio in 1896—a full 36 years after Annie was born.
Alan J. Ryff
St. Clair Shores, Michigan


THINK OF IT AS
A LIMOUSINE FOR
YOUR LUGGAGE.
CALL TOLL FREE FOR YOUR CATALOG OF 1990 VOLVOS 1-800-221-9136
© 1990 VOLVO NORTH AMERICA CORPORATION
THE 940 WAGON BY VOLVO

Hit The Road.

AND LIKE IT.

Some people refuse to give up style for comfort in a dress shoe. So they grin and bear it. While others are equally adamant about sacrificing comfort for style. So they avoid Mirrors. Regardless of which side of the road you stand on, now you can have it both ways.

Introducing Cole·Haan Tensile Air.® Now you can get the unabashed style of Cole·Haan and the advanced technology of Nike Air, together for the first time ever in a dress shoe. It's a collection for men and women who feel the same about their preferences in footwear. Uncompromising.

Engineered To Defy Gravity. Cole·Haan Tensile Air is engineered to have you walking on air. Quite literally. Two layers of tough urethane are bonded together by a complex network of fibers that gives Tensile Air its sleek profile. A patented gas is then pressurized inside the unit to form a permanent "air" cushion which eases the foot to a soft landing. Unlike conventional comfort systems that eventually break down, the revolutionary Tensile Air unit is unaffected by repeated impact. In fact, it's guaranteed never to compact or deteriorate for the life of your shoe. So regardless of how defiantly you hit the road, your feet will never hit the ground.

Get Comfortable With It. If you want to travel in unprecedented comfort and style, try on a pair of Cole·Haan Tensile Air. The more you wear them, the more you'll appreciate them. So go ahead. Hit the road. Pound the pavement. Stomp your feet. And love it. There's never been a dress shoe like it on earth.

COLE·HAAN
TENSILE AIR

DEFY GRAVITY

To find the Cole·Haan Tensile Air Collection near you,

Hit The Road.

This season, the Cole·Haan Tensile Air Collection can be found exclusively at limited retailers nationwide. So if you have to go out of the way to get a pair, at least it'll be worth the trip home. Look for the Collection in the stores listed below, premiering in October.

Women's Collection Available At:

ARIZONA
Bullock's–Scottsdale
CALIFORNIA
Arthur Beren Union Square–San Francisco
Bullock's–Select Stores
I. Magnin–San Francisco
Macy's–Select Stores
Marcello's–Newport Beach
Cole·Haan–Beverly Hills
COLORADO
Porter's Place–Denver
CONNECTICUT
Grossman's–Greenwich
Saks Fifth Avenue–Select Stores
FLORIDA
Harold Reason Shoes–Sarasota
Kemp's Shoe Salon–Select Stores
Macy's–Select Stores
GEORGIA
Globe Shoe Company–Savannah
Macy's–Select Stores
Saks Fifth Avenue–Select Stores
ILLINOIS
Cole·Haan–Chicago
INDIANA
De Jong's–Evansville
Jacobson's–Indianapolis
LOUISIANA
Macy's–Select Stores
MAINE
Cole·Haan–Freeport
MICHIGAN
Saks Fifth Avenue–Select Stores
MINNESOTA
Cole·Haan–Minneapolis
MISSOURI
Swansons–Kansas City
NEW JERSEY
Macy's–Select Stores
Saks Fifth Avenue–Select Stores
NEW YORK
Heller's Shoes–Mt. Kisco
Macy's–Select Stores
Saks Fifth Avenue–Select Stores
The Shoe Box–Manhasset
Cole·Haan–New York City
NORTH CAROLINA
Belk–Select Stores
OHIO
Arnold's Shoe Salon–Beachwood
OKLAHOMA
Rothschild's–Select Stores
PENNSYLVANIA
Saks Fifth Avenue–Select Stores
Strawbridge and Clothier–King of Prussia
RHODE ISLAND
Cole·Haan–Newport
TEXAS
Macy's–Select Stores
Margaret's–Lubbock
Mr. G Especially for You–Amarillo
Stanley Eisenman's Fine Shoes–Fort Worth
VIRGINIA
Montaldo's–Richmond

Men's Collection Available At:

ALABAMA
Parisian–Birmingham
Shaia's–Birmingham
ARIZONA
Bullock's–Scottsdale
CALIFORNIA
Arthur Beren Union Square–San Francisco
Bullock's–Select Stores
Gary's & Company–All Stores
The Hound Shop–San Francisco
Macy's–Select Stores
Saks Fifth Avenue–Select Stores
Cole·Haan–Beverly Hills
COLORADO
J. Baudine–Denver
Porter's Place–Denver
CONNECTICUT
Ed Mitchell–Westport
Saks Fifth Avenue–Select Stores
Stackpole Moore and Tryon–Hartford
FLORIDA
Macy's–Select Stores
Maison Blanche–Jacksonville
GEORGIA
Andre Bellini–Atlanta
Globe Shoe Company–Savannah
Macy's–Select Stores
Mark Shale–Atlanta
ILLINOIS
Mark Shale–Select Stores
Marshall Field's–Select Stores
Saks Fifth Avenue–Select Stores
Cole·Haan–Chicago
INDIANA
De Jong's–Evansville
KANSAS
Gordon's Shoes–Wichita
LOUISIANA
Macy's–Select Stores
Maison Blanche–Baton Rouge
MAINE
Cole·Haan–Freeport
MARYLAND
Hess Shoes–Select Stores
MASSACHUSETTS
George Davis Men's Shoes–Boston
MICHIGAN
Hudson's–Novi
Sherman Shoes–Select Stores
MINNESOTA
Dayton's–Minneapolis
Mark Shale–Minneapolis
Cole·Haan–Minneapolis
NEBRASKA
Lloyd's Shoes–Omaha
NEW JERSEY
Macy's–Select Stores
Saks Fifth Avenue–Select Stores
NEW YORK
Heller's Shoes–Mt. Kisco
Macy's–Select Stores
Saks Fifth Avenue–Select Stores
Thomas Miller Town & Country–Woodbury
Cole·Haan–New York City
NORTH CAROLINA
Belk–Select Stores
Thalhimers–Select Stores
OHIO
Golland Shoes–Select Stores
Saks Fifth Avenue–Select Stores
OKLAHOMA
Renberg's–Tulsa
Rothschild's–Select Stores
PENNSYLVANIA
David Michael Shoes–Chesterbrook
Macy's–Select Stores
Reyer's–Sharon
Sherman Brothers–Philadelphia
RHODE ISLAND
Cole·Haan–Newport
TENNESSEE
Gentry Hall–Select Stores
TEXAS
Macy's–Select Stores
Mark Shale–Dallas
Norton Ditto–Houston
Saks Fifth Avenue–Select Stores
VIRGINIA
Saxon Shoes–Richmond
Thalhimers–Richmond
WASHINGTON DC
Erik Harris–Washington
Hess Shoes–Select Stores
WISCONSIN
Roger Stevens–Milwaukee
CANADA
Calderone Shoes–Toronto
Harry Rosen–Toronto

COLE·HAAN
TENSILE AIR

For the Cole·Haan Tensile Air Retailer nearest you, and the Tensile Air Collection catalog, call 1-800-488-2000 (8A.M.-5P.M. EST).

TENSILE AIR
CREATED BY NIKE

The Tensile Air™ System from Cole·Haan is a patent-pending technology licensed to Nike Inc.

Around the Mall and beyond

It's movietime! Two blockbuster films are about to open, both with strong Smithsonian connections. First, chronologically, is *Dances With Wolves.* The title becomes clear about halfway through this powerful, beautifully made film. I hate sitting still for more than two hours, but this time I didn't notice. In literature, a strong, crystal-clear, well-paced story is called a page-turner. To me, this film was a twitch-queller.

Take a badly wounded, highly decorated Union Army lieutenant who has earned the right to choose an assignment. He opts for the frontier. He wants to see it before it's gone.

And so Lt. John J. Dunbar boards a wagon, is driven for days to a small fort on the edge of Sioux country, and finds it well stocked with supplies but completely deserted. He is the entire garrison, unless you count the wolf at his door.

That's the background for a wrenching, breathlessly exciting story of what our frontier and its people were really like in the 1860s. Kevin Costner plays Dunbar and also directs the movie—his first shot at the job. He provides us with a hero who is easy to take—a clever survivor who knows hurt, panic, anger, love, determination, and especially, curiosity. Because of that last, Dunbar sticks to his post, actually makes it livable, tames the wolf, tries to befriend his Sioux neighbors and is finally accepted by them. Seeing him play with his wolf, the Indians give him his Sioux name—the title of the film.

Questions assail the viewer of this spectacular and deeply moving motion picture: Where, for example, did Costner and producer Jim Wilson find this seemingly endless patch of beautiful, untouched prairie, stocked with buffalo? Answer: South Dakota, where they built a Sioux village of 45 lodges. The buffalo, about 3,500 of them, are from privately owned herds.

The film's Indians speak either Lakota Sioux or Pawnee, as the case may be (with subtitles). Some had to be taught the languages. Costner learned a good bit, too, for Doris Leader Charge, who plays the chief's wife, is really a teacher of the Lakota Sioux language and culture. He also had to learn bareback riding. So did many of the Indians.

Dances With Wolves premiered last month in Washington, D.C. to benefit the Smithsonian's newly planned National Museum of the American Indian and the Smithsonian Resident Associate Program. It opens in eight cities on November 9, and Thanksgiving week in numerous other locations around the country. You've never seen an "oater" like this. Details are as authentic as filmmakers can get them. You'll leave the theater shaken by new revelations about our American mystique.

Next: *Blue Planet.* It's the new Imax film, soon to fill that huge screen at the National Air and Space Museum's Samuel P. Langley Theater, thanks to the Smithsonian, the Lockheed Corporation and the cooperation of NASA. It's the most ambitious, most expert, most imaginative, most thoughtful one of all in the series of these giant-size movies that have kept us on the edge of our seats since *To Fly* opened in 1976.

The blue planet is, of course, our own Earth, as seen from space and then from the perspective of both feet on the ground. The views from above, shot mostly by the astronauts of five shuttle missions, give us a living globe, bright blue in the blackness of space. The Himalaya, Sinai Desert, Strait of Gibraltar, Caribbean, along with dozens of other

Lt. John Dunbar (Kevin Costner), Sioux leader ride in *Dances With Wolves.*

Divine Write

The Souverän® Rollerball. Heir to the luxury in every Pelikan writing instrument, it combines the convenience of a ballpoint with the liquid feel of a fountain pen.

It glides over paper. The German silver tip surrounding the smooth, ceramic ball makes sleek, fluid writing automatic. Precision craftsmanship gives it extraordinary balance.

Gleaming accents, including the distinctive Pelikan beak clip, are layered with 18 karat gold. Even the Pelikan crest is surrounded by a shining gold crown.

The Souverän Rollerball is made in West Germany and is available in traditional black or the green/black finish that's exclusively Pelikan.

In either case, it's look of majesty is unmistakable.

Pelikan®

Pelikan offers an entire collection of writing instruments in a variety of styles and finishes.
To find the dealer nearest you, call 1-800-874-5898.

$99.95
suggested retail price

R O L L E R B A L L

features that we studied in school, unroll before us—a scroll of camera-true relief maps. But we also look down on our environment—a swirling tropical storm, the "thin blue line" of our atmosphere—and we leap back to Earth to investigate at close range.

As a longtime fan of these large-format films, I recently made a short leap to Toronto, home turf of Imax Systems Corporation, to see how a bunch of bright Canadians were pulling this off. When I arrived, everyone was at the sound studio where music was being recorded for the movie. This involved a full orchestra behind a glass wall, and a couple of sound engineers in the control room working a console that outclassed the switchboard on the flight deck of a 747.

I was stupid enough to ask a question, and the engineer was courteous enough to answer, while his hands moved restlessly across roughly six million switches and levers and knobs: "We're recording onto a 32-track digital and we have already premixed synthesizers onto another 32-track machine, so we have a total of 64 tracks. When we mix down we run both machines locked to the picture. The sound system that we're mixing down to is a six-channel format. . . ." And so on. I suppose that to most everyone under the age of 40 this is like "See Spot run." But to me, it's pure Esperanto.

However, one either gets into the swing or falls off. I learned that Micky Erbe and Maribeth Solomon were honing the music that they composed for *Blue Planet*, as they did for its Imax siblings *Hail Columbia!* and *The Dream Is Alive*. They work as a team. Micky was conducting the orchestra, adding the depth of its strings to a synthesized segment. Maribeth listened in the control room, reacting quickly when the bit was done: "I'm not too comfortable with the timpani at the end. Can we try a little cymbal in there, Micky? And I'd like to hear that series in the fourth bar go *tum-te-tah-TAH*. See what I mean?" Then Micky would adjust his earphones and turn to the musicians. "Ready? Eight clicks to bar one." And with one eye on his monitor, where a videotape of the film reminded him where he was, he'd lead them into it.

The monitor helped me, too, in making sense of it all. Here was a view from space of a thunderstorm. Then I was back on the ground, watching a brilliant display of lightning. Next, from space, I saw a haze of smoke hanging over a patch of Brazilian jungle. Then I leaped Earthward into the jungle, where mighty trees of the Brazilian rain forest—vital manufacturers of oxygen—were blazing, engulfed in giant flames stoked by a crew of land clearers.

View from shuttle captures majesty of Earth in new Imax film *Blue Planet*.

As I watched this, Graeme Ferguson, the film's producer, nudged me and whispered, "Ben Burtt, our principal director, told me that when they asked the Brazilian farmer who owned the land if he minded having this scene filmed, the farmer said not at all—he *loved* Imax. Saw it at the Air and Space Museum!"

Graeme Ferguson and his wife, Phyllis, *Blue Planet*'s associate producer, are another Imax team. They're talented enthusiasts, quickly cordial, uncluttered by pomp. Graeme, with his partners, developed the Imax system for special theaters like the Langley. In 1985, he produced *The Dream Is Alive*, the most popular of these films to date.

Talking in the control room was difficult because music would suddenly erupt over conversation. I began to recognize themes for disparate parts of the story and understood what Graeme meant when he said music "glues the segments together."

What other segments? "Talk to Toni," he said. Toni Myers, writer-editor-narrator of *Blue Planet*, learned her trade as an apprentice to a film editor in Toronto. She wrote and edited *The Dream Is Alive*, and finds herself becoming a space specialist, one who over the years has developed a fine-tuned relationship with NASA. If Toni wants a certain shot, her enthusiastic collaborators in space will do their best to get it.

She had trouble shooting the Himalaya for this film. Every time the shuttle was in position for a panoramic view, it was either the astronauts' inviolable sleep period or nighttime down there in

European Featherbed

The Company Store's European Featherbed is just like a giant body pillow. Place it on top of your mattress or waterbed, or even on the floor.

Enjoy its natural warmth and body-cushioning comfort. It conforms to your body's contours and cushions pressure points, such as hips, shoulders and knees. The Featherbed is filled with a special blend of hand selected white European feathers. Its specially made feather- and down-proof shell is a soft 100% cotton fabric.

Pay in 4 interest-free payments of as little as $14.75 each. Call or send in the coupon below with your first payment. We'll ship your Featherbed the same day! You'll be billed 3 additional payments on a monthly basis.

We make our Featherbed in La Crosse, Wisconsin, our home since 1911. Satisfaction guaranteed.

FREE CATALOG

- Down Comforters
- Down Pillows
- Down Outerwear
- Cotton and Wool Domestics

TO ORDER OR TO REQUEST A FREE CATALOG CALL TOLL FREE

1-800-827-4250

The Company Store

©1990 The Company Store

European Featherbed

QTY.	SIZE	1ST PAYMENT

	Size	Price	Four Payments*
Twin	(39 x 75")	$59	$14.75
Full	(54 x 75")	$79	$19.75
Queen	(60 x 80")	$99	$24.75
King	(78 x 80")	$129	$32.25

*Shipping and handling ($6.00) and appropriate state sales tax (WI, MN, and IL only) will be added to your final payment. *No finance charge.*

Style # C502-900 Color: White

❒ VISA ❒ MasterCard ❒ American Express ❒ Discover

Exp. Date _____ ❒ Check or Money Order

Acct. No. _____

Name _____

Address _____

City/State/Zip _____

Mail to: The Company Store
500 Company Store Road, La Crosse, WI 54601

4250 Call toll-free: 1-800-827-4250

STARSHOOTER

An innovative American sculptor broadens the horizons of Western Art in hot-cast bronze.

The unshakeable spirit of the Indian warrior captured as never before by the prize-winning artist Lincoln Fox, who has exhibited at the Kennedy Galleries.

STARSHOOTER. Bold. Visionary. Every dramatic detail preserved in solid hot-cast bronze. Hand-finished to that classic patina characteristic of the great Western bronzes. A handsome hardwood base included at no additional charge.

Available only from The Franklin Mint. The price: $750.

Shown much smaller than actual height of 17" including hardwood base.

ORDER FORM

Please mail by November 30, 1989.

The Franklin Mint
Franklin Center, Pennsylvania 19091

Please enter my order for STARSHOOTER by Lincoln Fox, individually crafted in hot-cast bronze. My imported sculpture will be sent to me with its own imported hardwood base, included at no additional charge.

No payment is required now. Bill me for a deposit of $75.* when my sculpture is ready to be sent to me, and for the balance in 9 equal monthly installments of $75.* each, after shipment.

*Plus my state sales tax

Signature

ALL ORDERS ARE SUBJECT TO ACCEPTANCE

Mr./Mrs./Miss

PLEASE PRINT CLEARLY

Address

City

State, Zip

© 1990 FM

12432-7

Nepal and Tibet. But a camera was fixed in the bay and aimed Earthward, and astronaut Kathy Sullivan, a geologist, was so eager to get the picture that she broke her sleep period to turn it on. She sent Toni a message: "The great Himalaya range never looked greater."

The Imax people have trained dozens of astronauts to use the 60-pound camera (weightless in space, of course), and files are crammed with good footage. So Toni Myers has plenty to choose from when she plans such films as this. She marks up storyboards, using any pictures she can find of the kind of scenes that she needs. Leftovers from one film may become grist for the next.

But glitches are routine, and Toni's wish list is always subject to rethinking that can alter the story line. In a segment of *Blue Planet* dealing with meteorite collisions Toni wanted a space view of the great Quebec crater. Trouble was, it's too far north to be filmed from a shuttle that usually deviates only 28 degrees from the Equator. NASA solved the problem by providing a fine still of the crater, taken during an earlier mission that *had* ventured that far north. Toni had it reshot in Imax film.

Hurricanes show up clearly from space, and Toni already had one. But she needed to get near one at ground level for a close look. With eerie timing, along came Hugo. Graeme and Phyllis Ferguson went to Jacksonville, Florida, to intercept the storm, but their "command car" communication with NASA warned them that Hugo was going farther north. They tracked it to Charleston, South Carolina, and moved into a hotel on the night that Hugo struck.

"Our NASA contact called and asked what floor we were on," said Phyllis. "We told him the seventh, and he said we'd better get lower down. He asked about windows. We told him we had a lot of big ones, and he said we'd better find a room with none—like a bathroom. By that time, the storm was hitting, so we got some blankets and pillows and bedded down in the bathtub."

Then the hotel people moved everyone to the ground floor, and Graeme recalls a strange ordeal: guests crammed together along with pet dogs, cats, birds, while water seeped through cracks, and the night pulsed with the scream of wind, the screech of fractured metal.

So Toni got her hurricane. She told me she felt like a witch. But her earthquake was even eerier. Space shots clearly show the San Andreas Fault, and a computer-generated sequence in *Blue Planet* takes the audience on a simulated flight right down through it at blistering speed. For further ground coverage, the team had planned a trip to Japan to film schoolchildren diving under tables in a mechanically shaking room.

But again on cue, the San Francisco earthquake struck. No drill. The team, now dubbed "Disasters R Us," jetted up from Houston. All of them looked at Toni out of the corners of their eyes. Serendipity is OK, but, says Graeme, "we thought she was running Earth."

It took about five years to produce *Blue Planet*, and while it was being shot, some thought was given to yet another Imax film. "This one," says Graeme, "will deal with another view from the shuttle—outward to space, the stars, the other planets."

Blue Planet has its world premiere at NASM around the middle of December. People in 14 cities in the United States and Canada will see previews of it this month. They'll be fortunate, indeed.

Edwards Park

I'll Bet You Know Someone Who's Crazy About Crosswords!

Our 10th Year!

This Christmas give them a full year of delightful puzzles — still only $30!

Every month we send 5 completely original puzzles created exclusively for our members by the world's most talented (and devilish) constructors. Individually printed on fine, heavy paper each puzzle is the same size and caliber as those found in the Sunday New York Times, and contains a witty commentary by our editor, the legendary Will Weng.

Within 48 hours of receiving your instructions, we'll have an elegant gift announcement card on its way to you and we'll start your new member with the January 1991 puzzles.

Your satisfaction is guaranteed. Act Now! It's Easy to Order!

Send check for $30 (we pay the postage) or charge MasterCard/Visa. *Mail to:*

THE CROSSWORDS CLUB
Dept. 20205, 123 Elm Street
P.O. Box 635
Old Saybrook, CT 06475

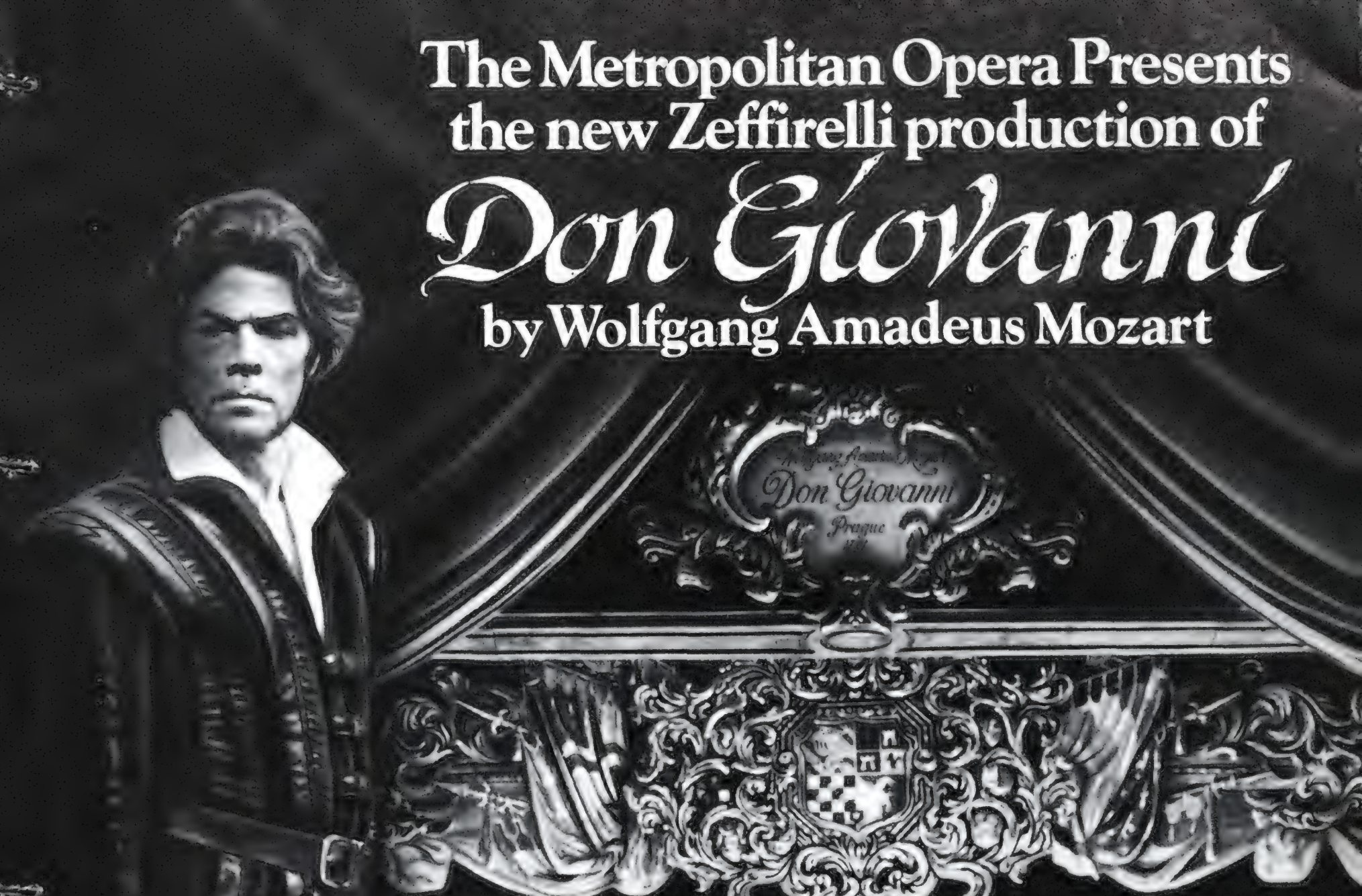
OR CALL TOLL FREE (800) 874-8100
(in Connecticut 203-388-6627)

THE CROSSWORDS CLUB

The Metropolitan Opera Presents the new Zeffirelli production of

Don Giovanni

by Wolfgang Amadeus Mozart



Watch the scandalous exploits of the legendary lover as seduction leads to damnation in Mozart's masterpiece.

Wednesday, October 31 at 8 pm Eastern Time on PBS.
Check local listings for channel.

James Levine, conductor

Carol Vaness
Karita Mattila
Dawn Upshaw
Jerry Hadley
Samuel Ramey
Ferruccio Furlanetto
Philip Cokorinos
Kurt Moll

Brought to you by Texaco.

With special funding from Mrs. Donald D. Harrington, and additional funding from The National Endowment for the Arts and the Charles E. Culpeper Foundation.
To order your free guide to the Texaco Metropolitan Opera Broadcasts call 1-800-MET-1990.

PHOTOGRAPHY BY WINNIE KLOTZ

Chrysler Imperial.

New Yorker Fifth Avenue.

Chrysler Safety. Because driver protection doesn't stop with the air bag.

Here's a safety advantage worth listening to.

VISORPHONE

Now Chrysler–and only Chrysler–offers Visorphone† The cellular phone that fits right in the driver's sun visor. With one-touch dialing and 100-number memory, it lets you talk on the phone and still keep both hands on the wheel. And when it's out of use, it's out of sight.

REMOTE ENTRY

Also available, our remote keyless entry system. A quick, easy

†Some equipment optional. *Excludes normal maintenance, adjustments and wear items. See 5/50 and 7/70 (powertrain) limited warranties at dealer

touch of the button unlocks the door or trunk, disarms the theft alarm† and turns on the lights inside the car. Consider the added convenience and safety when you're out late at night.

This concern for safety is engineered into every Chrysler New Yorker Salon, New Yorker Fifth Avenue and Imperial.

To solve the dangerous annoyance of headlights glaring in the rear view mirror, we offer the first electrochromic mirror† It automatically dims to reduce glare, while your hands never leave the wheel.

With speed-sensitive doorlocks†, if you don't remember to lock the doors, they lock themselves.

Chrysler's outside power mirrors are heated to prevent winter freeze-over.

Even something as simple as windshield wiper airfoils are included on all our cars. As speeds increase, aerodynamic pressure increases wiper pressure.

We even protect you against the costs of unexpected repair bills with our exclusive Crystal Key warranty. It comes standard with the Chrysler Fifth Avenue and Imperial, and it's the most comprehensive coverage of any luxury sedan. This 5-year or 50,000-mile bumper to bumper plan even exceeds that of a Rolls Royce or Mercedes.*

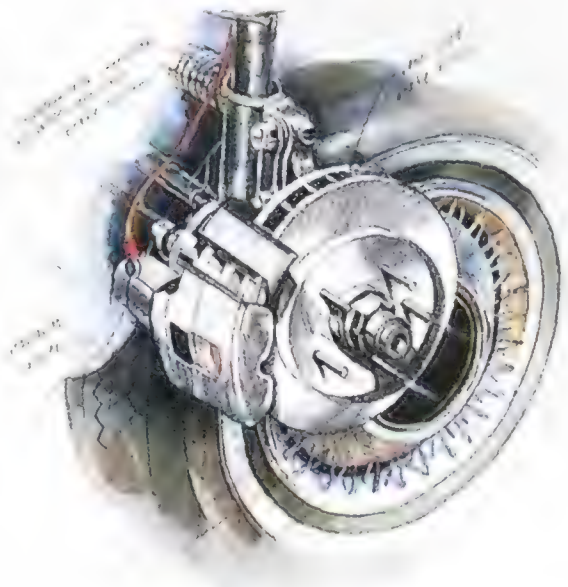
But nothing has done more for driver protection than adding the air bag to the use of the lap/shoulder belt.

AIR BAG

We were first to put an air bag in every car we build in the U.S.** And letter after grateful letter has been written to tell us one thing for certain–air bags help save lives.

Driver-side air bag.
Inflates in 50 milliseconds.

ANTILOCK BRAKES



Perhaps the only thing better than walking away from an accident is avoiding it. In that respect, nothing helps more than Chrysler's 4-wheel disc antilock brake system (ABS)† By preventing wheel lockup, it helps you retain steering control even in a sudden stop on a rain-slicked highway.

There is no luxury without engineering.

At Chrysler, we do more than just say we value our customers. We engineer a lot of important things into our cars because we never forget the most important thing that goes into our cars…you.

7/70

To buy or lease, please call
1-800-4A-CHRYSLER
Buckle up for safety.

Chrysler

Advantage: Chrysler.

Restrictions apply. Based on warranty information at time of publication. **Excludes vehicles built for Chrysler: Laser/Talon

Nobody knows total-body aerobic exercise like NordicTrack.

It takes a company with NordicTrack's reputation for innovative design, superior engineering and quality workmanship to develop a total-body aerobic exerciser as good as our new NordicRow TBX.

Twice the workout of ordinary exercise machines.
With NordicRow TBX, you don't just work your legs, as on stairclimbers, treadmills and stationary bikes, but you strengthen and tone all the major muscles in your upper *and* lower body. You get *twice* the workout of those other machines. Without twice the time.

Advancing the science of personal adjustability and comfort.
- Unique seat features a revolutionary **back stress management system** for proper posture and weight load distribution, maximum lower back support, and *comfort!*
- **Split-resistance settings** for individual upper and lower body workouts

Try NordicRow TBX in your own home for 30 days with no risk or obligation! CALL TODAY!

The same innovative design and quality workmanship you've come to expect from NordicTrack.

NordicRow TBX™ BY NORDICTRACK

FREE VIDEO AND BROCHURE Call **1-800-468-4491** ext. 756K0

NordicTrack, A CML Company — or write: NordicTrack, 141 Jonathan Blvd. N., Dept. 756K0, Chaska, MN 55318

There's magic in the way Charu serves afternoon tea in the John Hay Room.

That's why I call the Hay-Adams *my* hotel in Washington, D.C.

The Hay-Adams Hotel

Preferred Hotels

Across from the White House at One Lafayette Square

Washington, D.C. (202) 638-6600, (800) 424-5054

Phenomena, comment and notes

In Wyoming's badlands, a volunteer doing the "collector's walk" helps push the envelope of paleontology

Your first fossil, like your first kiss, is something you never forget. My first (fossil, that is) came in the sun-drenched badlands of northwestern Wyoming about five years ago. I had just come down off a ridge into an as-yet-unexplored gulley when I happened to glance to my right and there it was: three ebony-colored teeth sticking up out of the sand, like a tiny jewel thrown down into miles of desolation. For the space of several heartbeats I just stood there and looked at it. I could almost imagine it talking to me: "Long before there were humans, long before there were even monkeys, I was as alive as you are today. For 50 million years, through ice ages, through volcanoes, through the earlier wandering of the continents themselves, I have been waiting here for you to find me."

These are strange thoughts to be running through the mind of a rationalist, to be sure, but there is something about fossil collecting that stirs long forgotten and neglected regions of the soul. I think it must have something to do with the landscape.

Fifty million years ago these badlands (where I have repaired annually since that fateful encounter five years ago) were a low, swampy lakeside. It was just 15 million years after the dinosaurs had disappeared and mammals were dominating the Earth. Millennia of successive floods laid down layers of brightly colored rocks, so that when the land was lifted as part of the ongoing evolution of the Rocky Mountains, streams

More Than Just A Holiday Gift...

Smithsonian

membership is a year-long adventure that your friends will enjoy, appreciate and always remember!

• Holiday Gift Check List •

- ☑ SURE TO PLEASE
- ☑ LONG-LASTING
- ☑ EASY TO SHOP FOR
- ☑ ECONOMICAL
- ☑ A CONSTANT REMINDER OF YOUR THOUGHTFULNESS

Compare a year of SMITHSONIAN membership with other gift choices. Recall the crowded stores...the long lines... the wrapping and delivery headaches.

Convinced? Then fill out the accompanying SMITHSONIAN order card and drop it into the mail. We do the rest—which includes mailing you specially designed cards and envelopes to announce your gifts.

Such A Unique Multi-Faceted Gift!

There's so much to a Smithsonian gift!

There's so much to a SMITHSONIAN gift!

First there are the twelve monthly issues of SMITHSONIAN magazine, ranging through time and space to cover, uncover and discover so much of what's happened in our universe... and what's likely to happen.

Then there's Associate Membership in the Smithsonian, with all these benefits and privileges:

Discounts on books, records, art reproductions, jewelry and other items purchased from Smithsonian shops or catalogs... a warm reception at the "Castle" in Washington and dining privileges in the Associates Court restaurant at the Museum of Natural History...opportunities to join Smithsonian authorities on fascinating study tours...notices of Smithsonian traveling exhibits and regional activities...and more.

AND IT'S SO ECONOMICAL—ONLY $20!

Best news of all, you can enter gift memberships now for only $20 each. We've held the lines on price again—for the fifth consecutive year. (Is this true of any other holiday gift you can think of?)

You'll be delighted to announce your gifts with Smithsonian's unique and colorful cards. On one side is a beautifully illustrated tree, surrounded by antique toys. On the other, you'll find room for a personal message, as well as your signature.

You may pay for your gift order later if that's more convenient. But to make sure you receive your gift announcement cards and envelopes in time for the holidays, use the adjacent order card *today.*

For even faster service, call our toll-free number:

1-800-627-6143

Smithsonian Institution • Washington, D.C. 20560

cut through and created hundreds of miniature Grand Canyons.

Today, the land is desert, with about five inches of annual rainfall. Where the water runs off, it creates multicolored cliffs a hundred feet high. In the valleys, fantastically shaped rocks, worn by wind and rain, produce a landscape worthy of a Surrealist painting. Under the influence of winter freezes, brown and purple sandstones exfoliate in sheets of stone a fraction of an inch thick and several feet on a side (the Indians used them to make roasting ovens). Between the eroded areas stretch regions of open sagebrush populated by rattlesnakes and pronghorn antelopes, while over your head the deep-blue sky stretches from the snowcapped Rockies in the west to the Bighorn Mountains in the east. The land is so beautiful that if it weren't for the heat and lack of water it would have been covered with condominiums long ago.

The most compelling thing about it is the silence. No one can live in these badlands, and even tough range cattle have a hard time surviving. The result is that there is no noise except for the wind and the occasional falling rock. Last summer, I took my 5-year-old son along one day, to introduce him to the place. At one point, as we sat down to rest, I told him to listen carefully.

"What do you hear?" I asked.

He listened for a while. "Nothing."

"Yeah—isn't it great?"

When animals died here millennia ago, they stood a better-than-average chance of having their bones buried in the lakeside ooze before they were scattered far and wide by scavengers and running water. As ages went by and sediments piled on top of sediments, mineral-laden water flowing through the ground gradually replaced the calcium in those bones with other atoms. The result: a perfect replica of the original skeleton in stone—a fossil.

That fossil, formed under tons of overlying sediment that gradually turned into rock itself, remained buried for more millennia still. Then, as part of the complex chain of events that formed the Rocky Mountains, the area was lifted up and water began to run through it swiftly, cutting deep and creating the badlands. With each rainfall the cuts got closer to the buried fossil until, one day, the sun shone on it once more. For the blink of an eye, geologically speaking, it is at the surface and then, if it isn't taken into safe harbor in a museum or private collection, it crumbles and joins the other shards of stone washing down to the Mississippi and oblivion. The fossil collector, like a grizzly scooping a salmon from a stream, has to snatch his prize at just the right moment or lose it forever.

I came to be part of this strange enterprise quite by accident. I had been spending a sabbatical doing mathematical models of some events in the fossil record when, during a visit to the University of Michigan, I found myself in conversation with Philip Gingerich. Husky, sandy-haired and still an Iowa farm boy at heart, Gingerich has spent a good portion of his career putting together the world's best collection of fossils of early mammals. When it turned out that a major portion of his material came from a part of Wyoming less than an hour's drive from the place where I spend my summers in Montana, the next step was obvious. I asked if he'd

CASABLANCA SITKA NAVPLION ISLE OF PINES ASHDOD DUNEDIN YALTA PUERTO MADRYN HELLESYLT AKUREYRI VISBY FLAAM

CORFU STOCKHOLM AUCKLAND DUBLIN VENICE VILLEFRANCHE HALIFAX

ST. THOMAS VICTORIA WELLINGTON GIBRALTAR ST. MAARTEN CONSTANTA MACAPA

BEFORE YOU READ THE BOOK, SEE THE MOVIE.

It is that time of year once again when the four corners of the earth can magically be yours by dialing ten little numbers. For a complimentary copy of our new 1991 Cruise Atlas, call (800) 426-0821. Also available at this number—for a mere $9.95—is an in-depth Video Atlas detailing our many journeys. Enjoy one or both. The choice is yours. We look forward to seeing you on board.

TRAVEL HOLIDAY NUMBER ONE CRUISE LINE CONDÉ NAST TRAVELER

ROYAL VIKING LINE
THE WORLD'S FINEST

SYDNEY TANGIER JUNEAU LENINGRAD NAWILIWILI LISBON VANCOUVER LIVORNO PERTH MYKONOS KUALA LUMPUR NEW YORK

Bahamian Registry

© Royal Viking Line 1990

LENOX

Shown actual size

The collector egg reaches new heights of porcelain artistry

Lenox brings extraordinary new artistry to a great European collecting tradition with *The Lily Blossom Egg,* a masterwork in fine bisque porcelain. Exquisitely detailed, with a fully-sculptured rubrum lily and a graceful bas-relief design. Delicately painted by hand and enriched with pure 24 karat gold, this imported Lenox® original is the premier issue in a major new collection. To acquire this important first from the master artists of Lenox, simply mail your reservation by December 31, 1990. 588293

The separate display stand is as meticulously hand painted as the beautiful egg itself.

© Lenox, Inc. 1990

THE LILY BLOSSOM EGG

Please enter my reservation for *The Lily Blossom Egg,* an original work of art from Lenox, to be crafted for me in fine porcelain, painted by hand and decorated with pure 24 karat gold.

I need send no money now. I will be billed in three monthly installments of $13* each.

*Plus $3.75, total, for shipping and handling. Sales tax will be billed if applicable.

Mail to: Lenox Collections
P.O. Box 3020, Langhorne, PA 19093-0620

Please mail by December 31, 1990.

Name _____
PLEASE PRINT

Address _____

City _____ State _____ Zip _____
588293

☐ Check here if you prefer to have one charge of $39* applied to your: ☐ MasterCard ☐ VISA ☐ American Express

Acct. No. _____ Exp. _____

Signature _____

Fifty-million-year-old fossil teeth and jawbone of a lamb-size herbivore found in badlands attest to ancient, different Wyoming.

mind if I tagged along, just to get a feel for how the data I was modeling was actually obtained.

The next summer, as promised, a letter showed up giving me directions to the camp. It was, to say the least, somewhat cryptic: "Turn left at the Cretaceous sandstone outcrop. You're now in area mapped as Fort Union formation, but is it really?"

I was a little reluctant to intrude on the camp that first time. Here they were, professionals deep in their labors, and I was coming in pretty much as a tourist. Once I found the camp, though, these doubts dissipated. The way it worked was this: early in the summer Gingerich and his wife, anthropologist Holly Smith, and their students would pitch their tents in some remote little valley in the badlands. For the rest of the season (which can last up to eight weeks), their main form of recreation seemed to be going into Powell, Wyoming (pop. 6,000), on Friday nights to take showers at the police station. The group was *glad* to see visitors!

The routine of the camp was simple. About 8:30 A.M. everyone piled into the odd assortment of four-wheel-drive vehicles that they have accumulated over the years and set out for the day's "location." No point leaving earlier—the slanting morning sunlight makes it almost impossible to see fossils on the ground. The trip out to the location can be an adventure all by itself. Sometimes it's just a matter of bumpy tracks across the sagebrush, but occasionally a road that is plainly marked on the maps just doesn't exist anymore, or you find a six-foot-deep wash that wasn't there when the road was built. Even the four-wheel-drive vehicles can founder then, and everyone, from tenured professor to undergraduate, jumps out and grabs a shovel to dig out.

Once you get to the location, everyone scatters to do the "collector's walk." This is a slow stroll, body slightly bent at the waist, eyes fixed on the ground. The location becomes a shifting, changing constellation of people. This is the part of fossil collecting that surprises most first-time visitors to the camp—that there is actually very little "digging" involved. Fossils tend to be scattered thinly in this area, and the most efficient way to collect them is to walk around and pick them up when you see them. Only in those rare instances when more than a fragment of an animal is found—when someone turns up a complete jaw of a large carnivore, for example, or a skeleton that includes some bones from the body—do they break out the shovels and brushes.

And so it goes. Except for lunch and the occasional "How ya doin'?" encounters with his fellows, the collector's day is spent in solitude, scouring the desert floor for the telltale mottled black pattern that indicates the presence of bone, the line of dark points that betrays the buried jaw. All this in the sun, the fantastic landscape and the silence.

Socializing comes in the evening, when everyone gathers around a long table in the main tent and Phil Gingerich goes through the day's finds. Each significant fossil gets a catalog number and is then passed from hand to hand around the table before it is wrapped in tissue paper and put into a wooden crate. The highest accolade a collector can get is to have a particular fossil generate oohs and aahs as it makes the rounds. The worst fate is to have a fossil "misc'ed"—placed in a bag of miscellaneous, uncatalogued fossils that will languish for years in some dark corner of the museum.

Make no mistake—this is doing science the hard way. A phenomenally successful season may net 2,000 catalogued fossils, mostly single jaws. And yet, the very difficulty of the collection process gives it an allure. More and more, in other areas of science, data is entered on magnetic tapes and analyzed by computers untouched by human hands, unexamined by human intellect. A craft that used to be carried out by single men and women working alone in their laboratories is being transformed into something resembling a multinational corporation.

This shift is inevitable, given the complexity of the questions scientists are now able to ask, but there is always a nostalgic tug when we think about the old days. And so for me, after 20 years of manipulating mathematical symbols and staring at computer output, it was a joyful moment when I realized that fossil collecting would never join the rest of science in the rush toward automation, amalgamation and collaboration. At the center of the field there would always be the single collector out there on the desert, wresting data points from nature one at a time.

In the silence.

James Trefil
Robinson Professor of Physics
George Mason University

GENIUS WITH SUPER IQ CAPTURES COW WHO JUMPED OVER THE MOON.

Impossible, you say? Well, thanks to the Multi-Exposure mode of the IQ Zoom 105 Super, you too can turn a nursery rhyme into reality.

This brilliant new camera, the most advanced IQ Zoom yet, combines the convenience of a fully automatic compact with the advanced functions of an SLR, so you can easily capture just about anything your imagination can conjure.

The power zoom lens, first introduced by Pentax, lets you choose any focal length between 38mm and 105mm. And the Super Macro Mode really lets you milk all the details.

The IQ Zoom 105 Super has many other creative features which are remarkably simple to use. Fiddle with special effects created by sophisticated Exposure Compensation, Interval Shooting Mode, Bulb-Timer Mode, and more.

Advanced flash functions provide the right illumination, even on a moon-lit night. And capture yourself up to five times with the Multi-Frame Self-Timer.

So now you can catch all your favorite subjects, even the dish running away with the spoon. Just be smart enough to use your IQ!

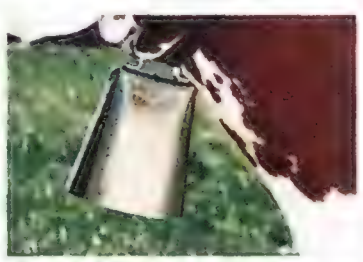
PENTAX

IQZoom105 Super

© 1990 PENTAX CORP

Captured by the amazing multi-exposure mode.

Self-portrait with self-timer.



Super macro rings the bell.

All pictures taken with the IQ Zoom 105 Super and Kodak Ektar film.

"The new Escort…a first-class compact that can go head-to-head with its Japanese competition."
–*Automobile* Magazine

Go straight to the source.

"The new Escort has better engines, better transmissions and a better suspension than we've ever experienced in one domestic compact."
–*Automobile* Magazine

The experts have found plenty to write about the new Escort's 1.9 liter computer-controlled engine, the only engine in Escort's class equipped with sequential electronic fuel injection. Usually found only on more expensive cars, the SEFI feature greatly improves performance feel.

They also point to Escort's standard 5-speed transmission (noted for its smoothness), and its new, optional electronically controlled four-speed automatic transmission that delivers smooth, steady performance. Smooth and steady also perfectly describe Escort's ride, provided by its new independent suspension system.

Of course, the best way to check the facts is to go straight to the source and sit behind the wheel of this new Escort.

The look says quality. So do the experts.

"Escort's fit and finish quality is excellent and it boasts the most modern of small-car interiors."
–*Automobile* Magazine

Buckle up–together we can save lives.

The new Ford Escort is built a totally new way, allowing for an exacting fit and finish.

Use of double galvanized steel and extra anti-corrosives, plus a special seven-step painting process adds to the look and feel of quality.

Inside lies a friendly environment with seating for five and a number of driver convenience features; easy-to-read analog instrumentation, a handy split-fold rear seat (LX model), and a wider expanse of glass for better visibility.

The design and performance of the new Ford Escort has already impressed the press. And it's bound to do the same for you.

"The new Escort gives Ford a car that is competitive with the world's best compacts."

–Popular Science Magazine

The New Escort. Only the name remains the same.

Have you driven a Ford...lately? Ford

Opposite: old boot on fencepost imparts a ghostly aspect to a field in Arthur County, Nebraska. The same feeling pervades the town of Arthur, where a lone bicyclist dawdles beside otherwise empty Main Street.

By Donald Dale Jackson

'You survive because everyone cares, everyone has walked in your shoes'

The frontier spirit is still alive and well in this sparsely populated Nebraska county, but that's not enough to assure a brighter future

"See that dip between the hills?" Margaret Hawkins asks, pointing to a saddle-shaped depression in the low, hummocky knolls on her cattle ranch in Arthur County, Nebraska. The new grass on the hills is a patchy, pale green carpet on this day in early May. "The story is that Paul Bunyan made that low spot when he sat down to rest on his way through here." The rangeland that rolls toward the horizon in a succession of long-shouldered mounds doesn't appear to have changed much since Bunyan passed by. Man's mark is minimal here—fences, an occasional windmill, power poles in the hazy distance. Air travelers gaze idly through the clouds at this emptiness and turn back to their magazines. This is the Sand Hills region of western Nebraska, smack in the heart of the Great Plains—cow country, tough and dry and stingy and a long, lonely way from mainstream America.

Margaret Hawkins, however, is pleased to be here. Wiry and cheerfully voluble at 62, she has run the 11,000-acre ranch with her daughter, Virgilene, and son, James, since her husband's death in 1977. This afternoon she and Virgilene are doing what they do three times a week from October through May, come rain, ice or blizzard—feeding their cattle from a wagon pulled by two thick-legged draft horses. Virgilene

Photographs by Gail Mooney

Jesse (left) and Cody Larsen, grandsons of county rancher Bruce Larsen, ride pony in an Arthur parade.

Keri Watson gets her steer ready for presentation at the county fair as part of her 4-H club project.

drives the wagon so her mother can be where she wants to be, astride her quarter horse. "I've never lost the thrill of riding a horse," she says. "I'm thankful every time I do it. I read something once about seeing the beauty of the everyday. I believe that."

The beauty of the everyday becomes more elusive when the wind screams and the temperature dives below zero, but Margaret trusts her horse to get her home whatever the weather. "In a storm you want an older stud," she explains. "He's tougher and smarter and has more incentive to live than a gelding. He can find his way home from the feel of the wind on his face. Of course you also wear several layers of clothes."

"How many have you got on now?" Virgilene suddenly asks, smiling. Her mother looks momentarily flustered, then does a quick inventory. "Four," she replies crisply.

The feed wagon rolls slowly from pasture to pasture, drawing a chorus of bovine bellows whenever it clanks into view. Virgilene discharges cakes of processed grain at each stop. Angus calves a day or two old test their ungainly new legs as they scurry beside their mothers. Margaret descends from a ridge where she's been patrolling for stragglers. She gestures at the newborn calves. "I still get a kick out of every spring," she says. "It never gets old."

On the map Arthur County is a patch of unsmudged white, roughly 36 miles wide by 24 miles long, its borders tidily linear in the manner of Great Plains jurisdictions. The line between mountain and central time zones is just east of Arthur, making it hard to show up on time at the various games against the county's eastern rival, McPherson County. The football team is down to a six-player version of the game (it was eight in the 1970s) because the county population, as of the preliminary 1990 census, is 462; the high school enrollment is 20. This makes Arthur, in population terms, one of the six smallest counties in the United States.

"We had a robbery at the garage . . . they got $20"

The county has no railroad, no Interstate highway and no rivers or streams. It has no traffic signals, no resident doctor or dentist, no lawyer or psychiatrist. No Asians, blacks or Hispanics live here. It lacks a motel, a fax machine, a hamburger franchise, a building code, a country club and a Catholic church. It is virtually without crime ("We had a robbery at the garage six months back," Sheriff Bill Simpson allows; "they got $20"), judge or jail. There is no Little League or Boy Scouts, no drugstore or drug dealer. What it does have is a grocery store (run by the sheriff), a weekly newspaper, a veterinarian (since cows outnumber people about 60 to 1), a bank, a couple of bars and garages, two places that rent videocassettes, three one-room

Burly draft horses provide the power that operates hay-stacking equipment on Haythorn Land and Cattle Company ranch. Only one other spread in the county still uses horses to help put up hay, the main crop.

country schools and plenty of oxygen. It has a tennis court paved to the baselines and a golf course, with no traps but sand "greens," that adjoins and surrounds a lumpy, somewhat whimsical airstrip. Its sole town of Arthur, named like the county for our 21st President, Chester A. Arthur, has a population of 115, most of them senior citizens. Listings for the county fill a page and a half in the phone book.

Arthur County's lone industry is raising beef cattle. The soil is too dry and sandy for farming, except for the lowland "wet meadows," where ranchers put up hay. Homesteaders with their 160-acre plots never had a chance here; the forlorn groves of cottonwoods they planted, which still dot the range, are silent evidence of their crushed hopes. An average spread for one of the 60 to 70 family ranches in the county today runs about 3,200 acres.

History has a short reach here. The Sand Hills were still largely unsettled in 1893 when historian Frederick Jackson Turner, after mulling over the results of the 1890 census, wrote his controversial essay about the significance of the American frontier. It was 1913 before Arthur was formally organized as a county, and it remained a de facto frontier until paved roads and electrification arrived in the 1950s. Nowadays, however, malls, supermarkets and an Interstate are less than an hour away in Ogallala (pop. 5,060), satellite dishes sit beside many ranch houses, and virtually everyone has a phone.

But there's a real danger that Arthur may not last long enough to celebrate its centennial. Its population has been dwindling for 50 years. Unless daddy owns a ranch, there are no regular jobs for the young people who stay. Only one new house has been built in Arthur in eight years, no new businesses have started up, and there is a good chance that the high school will be forced to close and send its students elsewhere.

Frank Popper, a professor of urban studies at Rutgers University, and his wife Deborah, a geographer, have written frequently about the dilemma faced by places like Arthur. Citing what they see as a steady decline in the water table, an uncertain future for the cattle business and a shortage of viable alternatives, they predict that hundreds of towns like Arthur will die in the next 50 years. Based on the initial results of the 1990 census, that process is already under way. Indeed, any hopes that the back-to-the-land movement of the 1970s might reinvigorate the nation's agricultural

Don Jackson is an old hand at writing about the American West. As soon as he arrived in Arthur County, he says, he felt at home there.

James Hawkins takes his turn during the calf-roping event at the annual county rodeo. The object is to rope and tie up a calf faster than anyone else. Hawkins and sister, Virgilene, help their mother, Margaret, run an 11,000-acre ranch.

areas were dashed by the latest population study, which documents significant rural losses not just in the Great Plains but all across the country.

The Poppers would like to see Uncle Sam buy up Plains ranches as they go broke and return the range to a restored grassland that they call "the Buffalo Commons." Folks in Arthur County, who view this idea as deranged, might be appalled if they knew about an even more drastic notion that's beginning to receive serious attention in some quarters. It goes by the ominous name of "triage," the process used by the French in World War I to select for medical treatment only those wounded soldiers who appeared to have a good chance at survival. As public policy, triage could seal the fate of places like Arthur County by concentrating government funding on other regions that can better serve as centers of growth.

Questions of life and death are an everyday matter for Tim Knott, Arthur County's lone veterinarian, who is the busiest man around come spring. Today he's visiting several ranches to test the sperm of the bulls who sire the annual crop of calves. A bull with a low sperm count is apt to be sold and converted to hamburger. Ranchers frequently dump dead calves in the vet's driveway so he can determine what killed them. Last night he was up till 4 A.M. delivering a stillborn calf with two heads. "I've had two or three," he says, "and two sets of Siamese-twin calves."

Tim, who is 43, keeps up a good-natured patter as he works. When one rancher sprints to close a gate on a bull attempting to escape, the vet grins at the man's wife. "You didn't know he was that fast, did you? You probably haven't been chasing him lately." At another ranch the conversation touches on a recent roller-skating party for grammar school kids and their parents at the nearest rink—65 miles distant. Tim missed it.

"Did you skate backwards?" he asks the rancher.

"I don't skate backwards," the man replies solemnly.

"How about on one foot?"

"Did that a few times, but not on purpose."

At a third ranch the talk turns to Frank Popper and his Buffalo Commons idea, which has made the evening news in the Sand Hills. "I think he's a little off in the head," the man says. "What's he think people are going to eat?" The cattle business is profitable at the moment, but foreclosures remain common.

Back on the one-lane oil road, Tim exchanges waves with a man on a tractor. The vet is a rarity in Arthur, a local boy who went away to college but found a job back home. "When you work with people here it's like you're part of the family," he says. "If it's mealtime they share what they have with you. I never bring a lunch—that would be an insult."

Long drives to school parties and basketball or football games illustrate a fact of life that is as constant as the wind in Arthur County: the need to accommodate, in one way or another, to do without. Improvising helps. In a place lacking both trees and running water, for example, the old axiom is that "the wind pumps the water and the cows chop the wood"—wells are windmill-powered, cow chips provide fuel. In the years before satellite dishes, Arthur folks would sometimes rent a motel room an hour or two away just to watch television.

But the price of remoteness and scant numbers is highest when sickness strikes. Arthur's volunteer am-

bulance can usually get a patient to the hospital at Ogallala in less than an hour. The doctor no longer maintains an office in town, though he is available on call. "I wanted to keep the office, but there were days when only one patient showed up, and I couldn't make a living that way," explains Dr. Erik Johnson, who divides his time among three other towns.

Neighbors can be counted on in an emergency, and with minor complaints the tendency is to tough it out. "My son had bronchitis the winter he was 4 and we had to get to the hospital," Sandy Zibell recalls. "There was new snow on the roads, but our neighbors helped put chains on our pickup and plow the road." Dr. Johnson has found very few hypochondriacs in Arthur. "They don't call a doctor until they have to, and they take care of the little things themselves. They're forever taking out their own stitches."

But life in the slow lane has its pluses, as well. A comfortable three-bedroom house goes for about $35,000, and property taxes are correspondingly low. Days in Arthur drift by at a leisurely tempo, and nobody worries much about stealing an hour or an afternoon from productive labor to do something more pleasant, or nothing at all. When an Arthur team is competing, a good chunk of the populace turns out to watch. "If a UPS man has a delivery when a game's on, he goes to the field to find you," says Karen Sizer, who works for the weekly Arthur *Enterprise*. "If there's a school play on printing day, we're just a little late."

Just about everyone in Arthur, in fact, participates in just about everything that happens in Arthur. The high school, with 26 students last year, fielded teams in football, girls' and boys' basketball, track and girls' volleyball, and a band. At any given time a quarter of the women in the county are on the "hospitality committee," which furnishes food for the funeral dinners that draw hundreds of mourners. When a ranch brands calves in the spring, men from neighboring ranches turn up to help, knowing that the same thing will happen when they brand; Arthur's phrase for this custom forged in need is "trading help."

"I hear about people not wanting to get involved with each other in the city," rancher Chet Kramer says. "Here it's the opposite; people actively want to get involved with you." The flip side of the full-participation society is the absence of any place to hide for those so inclined. But most of Arthur's 462 citizens accept and count on the connectedness and mutual dependence that binds them. "I think you survive here because everyone cares, everyone has walked in your shoes," says Tim Knott's sister Karol Cooney. When Karol's son Shawn was killed in an accident "the whole town grieved with us; it was as if he belonged to everyone."

The branding-day action at Bruce Larsen's ranch begins just after sunup, when a half-dozen men on horseback start cutting calves out of the bawling herd and driving them to a three-sided pen. By 8 the irons are heating in a propane stove and 30 men, wearing gloves and down vests and windbreakers against the chill, are clustered at the open end of the pen.

A local threesome enjoys an afternoon match at the county's nine-hole, par-32 golf course. The Cactus Flats course lacks the usual sand traps, but the greens are made of sand, not grass. The plane in background is parked on county airstrip.

Margaret Hawkins fondly traces the flower design on her saddle; it's the same one her father had on his.

Veterinarian Tim Knott tests a cow for pregnancy and inoculates it for disease that kills newborn calves.

School Superintendent Frances Vasa (left) helps Neil Bolin (center) and his father, Jim, round up bulls.

Suddenly everyone is in motion. A pair of cowboys rides into the dense mass of calves and quickly ropes two, dragging them toward the fire. A few yards from the stove, two other men grab each 150-pound calf and hold it down, one kneeling on its neck and the other clutching its hind legs. Now three more men, each bearing a different implement, home in on the downed calves. One vaccinates them in the hip, the second clips a piece of ear as an identifying mark, and the third administers a hormone injection—all in about ten seconds.

The action is so smooth and practiced that it seems choreographed, a cowpuncher ballet with everyone moving in perfect rhythm. The needle-wielding team now gives way to a man with a sharp knife who swiftly castrates the males, dropping the severed parts into a plastic bucket—to be fried and eaten later. Last comes the branding, the smoking iron eating into the animal's hide for about eight seconds. The calves are then released to look for mama and peace.

Shortly after 11, with all 380 calves branded and a cold rain falling, the men move to a large Quonset barn where beer, soft drinks and a card table are waiting. Their game is "pitch," a cousin of "hearts" and the official Arthur card game. The women soon announce that lunch is ready. The guests dive into plates burdened with barbecued beef, ham, chicken and taco casseroles, a half-dozen vegetables and salads, and an entire table loaded with desserts. If a man is neighborly enough, he can gorge himself this way three or four times a week in branding season.

Arthur's frontier past is fresh enough that its lessons persist, not only in customs like neighborhood brandings but also in the memories of people like ex-rancher Lester Summers, who is 89. "We got together because we were all in the same hole," he explains. "Nobody was uppish. Everybody pitched in because we never had anything. Why, my dad grabbed every dollar that was going by. He freighted coal, fiddled at dances, raised crops along with cattle. With industry and a

The bulls must be separated from the cows in the fall for the nine-month duration of the calving period.

Dr. Erik Johnson checks the ears of Lester Summers. Johnson no longer maintains an office in Arthur.

Sheriff Bill Simpson, who also runs the town grocery store, serves up barbecue at the Arthur County fair.

little sense you could make a go of it. There was one family that ate nothing but sauerkraut and potatoes all winter. It was a frontier for sure, but we're pretty civilized now."

Something of the frontier is still discernible in the Arthur character, too—toughness, a certain steadiness. Karol Cooney, who works with her veterinarian brother, recalls the time a bull knocked an elderly rancher down and ran over him. "He got this lump on his chest," she remembers. "He figured it was blood. After a couple days he finally saw a doctor and found it was a punctured lung. The lump was air." People seem to accept death with similar equanimity. "They won't go to the hospital even with a heart attack," Dr. Johnson says. "The attitude here is, when it's your time, it's your time," Sandy Zibell adds.

Self-sufficiency is another frontier virtue that survives. "People don't get panicky," Karen Sizer says. "They're used to taking care of themselves." "If people need to fix their truck or their plumbing, they can do it," Tim Knott adds. If your car quits on a lonely road in winter and you can't fix it, you either walk out or wait for the three-day-a-week mailman.

The prevailing attitudes about money are generally so old-fashioned, straight-ahead honest that in this overdrawn age they appear almost quaint. With ranch hands earning $800 to $1,200 a month (plus free rent and other extras) and the sheriff pulling down $13,900 annually, it's no surprise, as Tim Knott says, that "people here know what things cost." But they pay willingly and promptly. "It amazes me," Dr. Johnson says. "Most everyone who's not on Medicare pays with cash or a check when they come in. They don't wait for the insurance check."

One tradition that seems to be fading in Arthur is the cowboy work ethic, and perhaps cowboys themselves. Mert Phillips, the 55-year-old manager of one of the county's largest ranches, complains that capable cowhands are rare nowadays; he's resorted to want ads to recruit them. "Anymore, cowboying's not their life's

Curtains still soften windows in an elementary school that was abandoned five years ago for lack of pupils.

work," he says. "They move on to other things." Mert believes they've also lost some of their "sand." "We'll get town kids now who know about ranching from movies. It looks like fun at first, then it gets cold, they take a walk a couple times, there's fencing and feeding and haying and snow and rain. Some don't last two weeks."

Mert is partial to cowpunching Old West-style. Every year since 1985 he and his men have conducted roundups on their 47,000-acre spread on horseback with a chuck wagon. The cowboys pitch tents, staying out two weeks in spring and ten days in fall. Some evenings their families join them. "I always wanted to do it that way," he explains. "In the old days they had to, and I like to keep a little of the past. Is that romantic? I expect so."

The little tin-sided school looks lost on the empty, rolling plain in the northeastern part of the county. A few worn-looking playground structures—swings, a teeter-totter—sit wanly in the windblown yard. Inside, 24-year-old teacher Jodi Storer shares a table with her two fourth-graders. The seven other children—two kindergartners, four second-graders and a third-grader—work at their desks. A globe and an American flag stand in one corner, a copier in another, a small animal tank in a third. This school, like Arthur's two other rural elementary schools, has closed periodically over the years with changes in the district population. The subject at the moment is a *Weekly Reader* article on year-round schools in Los Angeles. Jodi reads aloud that 600 schools there remain open during the summer. Stacy Reed's mouth drops wide open. "Six hundred schools?" she gasps.

"Do you think we should be open in summers here?" the teacher asks.

"No way," Jessi Zibell replies. "We have to put up hay and help with the garden."

The conversation moves to another, equally alien phenomenon.

"Do you know what an apartment is?" Jodi asks.

"It's like a motel," Stacy ventures.

Jessi ponders. "It's houses stacked on top of other houses," she says.

Pluses and minuses of rural schools

A few minutes later the kids line up for recess—the "line leader" in front, followed by the "paper person" and so on, back to the "board eraser." Free to relax a few minutes, Jodi talks about the pros and cons of country schoolteaching.

"It's personal enough so that I can cue in to each kid's individual style," she points out. "I have one who has to touch everything and another who's all visual, and I can deal with them through their strengths." The downside is no hot lunches, no help with special

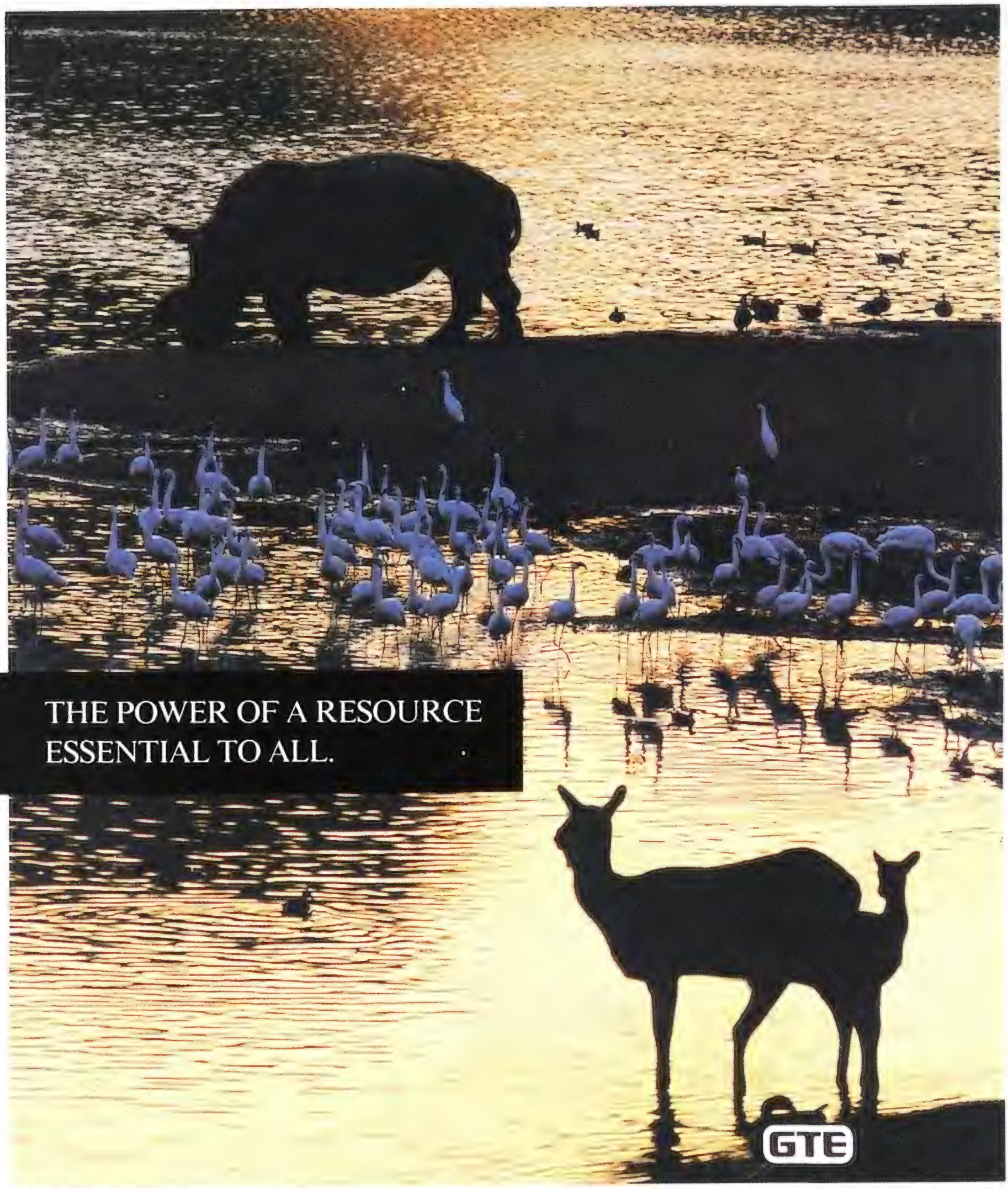
Telephone services and systems. Vital. Elemental. The power to support any successful enterprise in today's competitive world.

At GTE, we give you that power. In 38 states, our telephone capabilities are central to communities, families, businesses, great or small.

Through services like GTE CentraNet,® growing businesses are provided telecommunications technology equal to that of larger corporations. Without expensive on-site equipment.

At GTE, we give you the resources necessary to flourish in any environment.

Because at GTE, the power is on.



THE POWER IS ON

In her one-room schoolhouse, teacher Jodi Storer goes over a lesson with Clayton Zibell, a third-grader.

High school's scaled-down football team practices near weedy bleachers. Closest opponent is 40 miles away.

subjects like music and art, and the poor salary. Jodi started at $12,500.

Although she attended college in Wyoming on a rodeo scholarship, she frets now that her girls—all of whom have their own horses—might be "too boyish." To stretch their horizons she took the class to a movie in Ogallala ("Some of them had never been to a movie house") and organized a ski trip to South Dakota.

When recess ends the second-graders troop in for their reading lesson—an article about the experimental "Biosphere." Clayton Zibell studies a picture of a model of the high-tech structure and its life-sustaining components. "I think I see the barn," he announces.

The girls of District 33 aspire to be artists, scientists and veterinarians, but gap-toothed Clayton and the boys all yearn to be cowboys. In a composition on "the best year of my life," Clayton wrote that his was the first year he was allowed to ride on the roundup at Mert Phillips' ranch with his father and the other hands. "The gies picked on me," he wrote, "but I got to ride my horse, rope calfs and holed them down. They called me Zibell."

The future of its schools is the chief anxiety simmering beneath Arthur's placid surface. "It's getting fashionable elsewhere to mix kids from different grades the way we've always had to do," Tim Knott's wife, Shelley, laughs. "We're so far behind, we're ahead." But with only 20 students in high school, the lowest enrollment ever, the cost per pupil is so high that it would be cheaper to send them to Ogallala and pay tuition. The state might also withdraw the school's accreditation if certain subjects (French, for example) are not offered (perhaps because no one chooses to take them).

Arthur parents sense a vise tightening. "There's a feeling at the state level that bigger is better," Karol Cooney says. "The state wants to close the country schools and send all the grade school kids to town. They don't understand the hardship that would mean for parents who'd have to drive them in every day." Arthur's lone school bus is reserved for sports and other activities.

Closing the high school could trigger a spiral leading to disaster for Arthur. If Tim Knott's son or Sheriff Bill Simpson's boy attended school 50 miles from home, they would have to board, and the families might seriously consider moving. The county would lose its vet and its lawman. Young ranch families face the same choice. "People would have to buy or rent a second house, and the wife might stay in town with the kids," Chet Kramer says.

The result would be financial strain, personal anguish and an almost certain reduction in population and services, the decline that Frank Popper and others foresee. The bank and grocery might fold. The larger ranches would probably survive, buying up the smaller ones. But in a decade or two Arthur would be another Plains ghost town.

The infusion of money, business or ideas that could

Ties that bound a new nation

On May 10, 1869, when the last spike for the new transcontinental railroad was driven home, church bells rang in cities from New York to Omaha. The new road symbolized unification of a sprawling new nation.

At first, the idea of a railroad across the continent had seemed foolish, if not impossible. But an array of 20,000 men endured incredible hardships for six years to complete the road.

Watch *The Iron Road* on *The American Experience*, hosted by David McCullough.

The American Experience

Monday, November 26 at 9 p.m.(ET) in most cities, on public television.

Made possible by Aetna.

Ætna

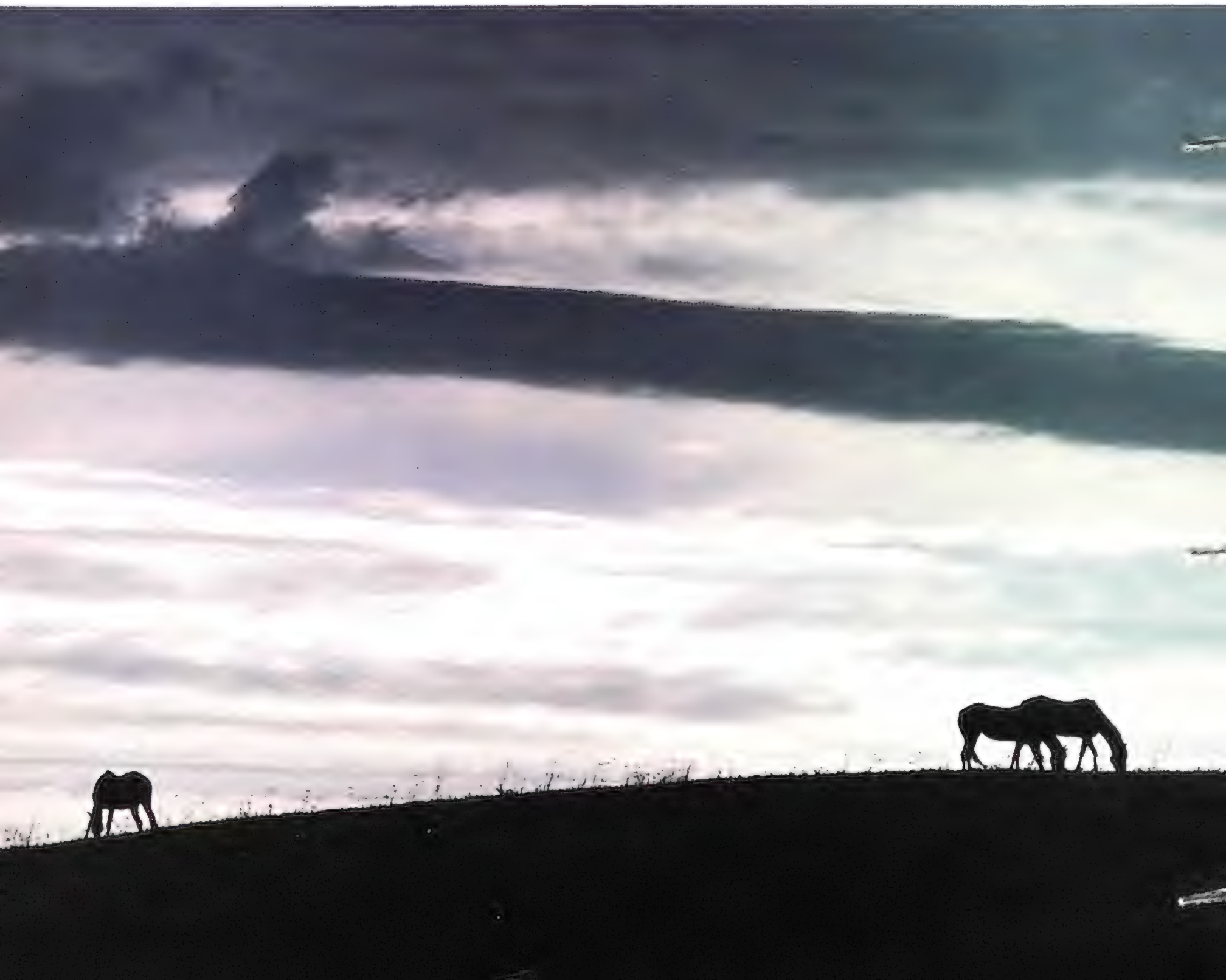
reverse such a spiral is nowhere in sight. A small manufacturer from another Nebraska town considered expanding to Arthur a few years back, but the plan quickly collapsed. With no Interstate or railroad, there is no convenient way to get raw materials to Arthur. Jobs for local graduates are all but nonexistent. "We need any good idea we can get," says Kramer, who is one of three county commissioners. "It's just damn tough to think of anything to bring new people here."

The experts viewing Arthur's dilemma from afar offer little help. The Poppers maintain that, as places like Arthur decline, the "frontier adaptations" of earlier years reappear—home schools, circuit-riding preachers—but these are only way stations on what they see as a one-lane road to desolation. They envision the Buffalo Commons as a national playground offering safaris, "environmental shrines" and mass horseback treks, a consummation they call "Pony Express chic."

Researchers who advocate a triage policy, which would in effect abandon the small towns with the weakest prospects by withholding public funds, are not unmindful of the impact on those who live in such communities. In fact, the whole point of adopting triage as a resettlement policy is to make effective use of limited resources by concentrating them on the most promising centers of growth. Those communities, in turn, could provide the jobs and homes that people from dying smaller towns need to assay a fresh start.

A few scholars have studied rural depopulation in Kansas and Iowa recently. At one time they were colleagues at Kansas State University. John Keller is still a professor of regional and community planning there. Mark Lapping is at Rutgers, in New Jersey. Thomas Daniels is a planner in Lancaster County, Pennsylvania.

Horses graze contentedly in Arthur County. Such scenes evoke strong feelings about the American West.



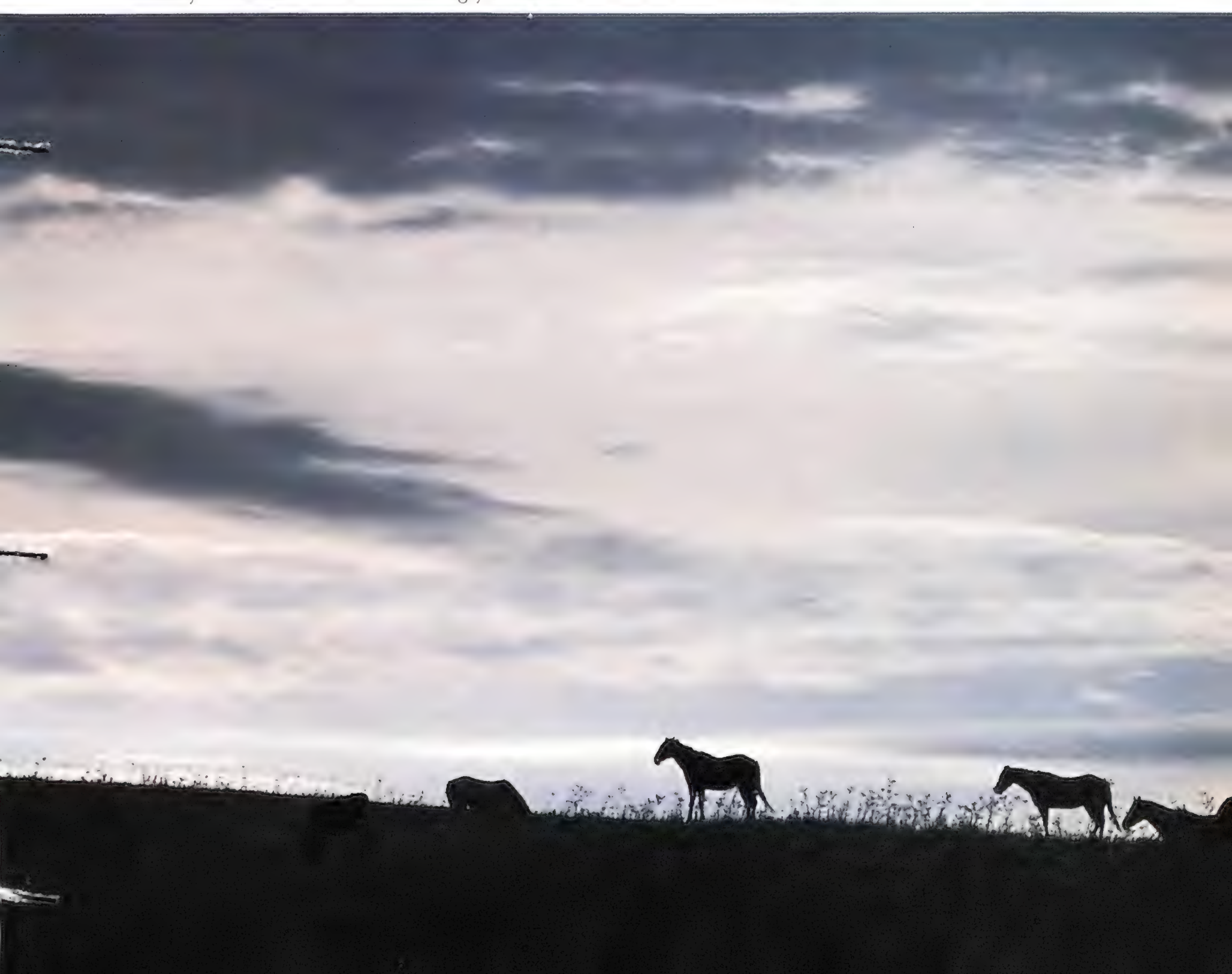
In both Iowa and Kansas, they report, hundreds of small communities and counties are competing for a limited number of new industries. It's a wasteful process, they say, and one that gives a distinct advantage to larger towns. Meanwhile, until some kind of regional growth-center policy is put into effect, people who reside in declining small towns can not expect hard-pressed state and federal agencies to continue covering a large percentage of their public-service costs. With or without an official policy, in other words, many communities are destined to wither on the vine.

Philip Burgess, president of the Denver-based Center for the New West, a think tank devoted to Western economic growth, foresees "human casualties" in the future for towns like Arthur. "And that's sad," he says. But Burgess and his colleagues suggest that dude ranches and home-based telemarketing or computer programming may be possibilities for such towns.

"How is a town supposed to die gracefully?" asks Patricia Limerick, a Western historian at the University of Colorado. "Can people make themselves and their way of life a consumer item like a dude ranch without losing their soul? Maybe not."

One hopes that Arthur County, notwithstanding all its problems, won't lose its soul or its spirit. "Do you know what a 'can't day' is?" Margaret Hawkins asks. "That's a day when it's so dark that you can't see when you start in the morning, and you can't see when you come in at night. We have a lot like that, but we survive them." There will probably be plenty of can't days and won't days and never days in Arthur's future. Lester Summers, at 89, will miss most of them, but he knows where he'll be. "If they tried to bury me anyplace but here," he says, "I'd kick the lid off the coffin."

Will it continue to embody the values of the frontier? Probably—but Man's role is increasingly in doubt.



An extraordinary look at the frontier that's long gone

British-born Evelyn Cameron loved the spirit and rough vitality of eastern Montana. Now they are seen in a trove of her eloquent photographs

"The great hunting days are over in Custer County and the ranchman and granger will see to it that they never return. About all that is left to the sportswoman today is to hunt with the camera," Evelyn Cameron told the New York *Sun* in 1906.

In truth, she had been hunting with camera in eastern Montana for 12 years, and her quarry was by no means limited to game. She had gone there with her new husband, Ewen, on a hunting trip in 1889—quite a lark for the cultivated upper-class English of the day. They remained for the rest of their lives, and Evelyn settled into ranching with gusto—gardening, roping cattle, branding, breaking colts, digging coal, splitting wood, milking, laundering even when clothes froze to the tub and using bacon fat to polish her floor.

Their frontier life, however, did have its lighter side. As in Arthur County today (see page 40), where a morning of cattle working is capped by a barbecue and cards, the delivery of a load of hay to the Camerons in eastern Montana could precede a feast of porcupine croquettes or fawn haunch—and cards.

Evelyn once wrote a niece in England: "Manual labor . . . is about all I care about, and, after all, is what will really make a strong woman." It was just as well. Ewen had dreamed of the riches that breeding polo ponies for wealthy Europeans would bring, failed abysmally, and thereafter busied himself as an amateur naturalist and ornithologist, leaving ranching and breadwinning pretty much to his wife.

Everything about the frontier captivated Evelyn: the open vastness of the prairie and the eerie formations of the badlands; ranching, as it gave way to wheat farming; the coming of the railroad; the birds and animals. And especially those hardy, determined souls who struggled to make it all work. In 1894 she taught herself to operate a camera so that she could chronicle all of it.

In autumn 1907, Minneapolis' Williams family were among the earliest homesteaders to settle here.

Most of her photographs were commissioned; the Camerons needed the money. Lugging her eight-pound Kodet, a supply of fragile 5-by-7-inch glass plates and a heavy tripod, Evelyn set off on horseback across the prairie, riding for hours, sometimes days. "My hip is bruised from the camera's pressure," she noted after one trip.

The need for long exposures was a given, so the clarity and spontaneity in her portraits of people and

With then abundant rainfall and new, mechanized equipment, it was ideal country for dry wheat farming.

By 1909 their farm was well established. Cameron photographed Mabel toting water to the threshing crew.

animals are remarkable. She always took great care with composition; witness the three months spent photographing a golden eagle's nest from eggs to fledglings. The young became so used to her they allowed her to position them, composing her shot as she wished.

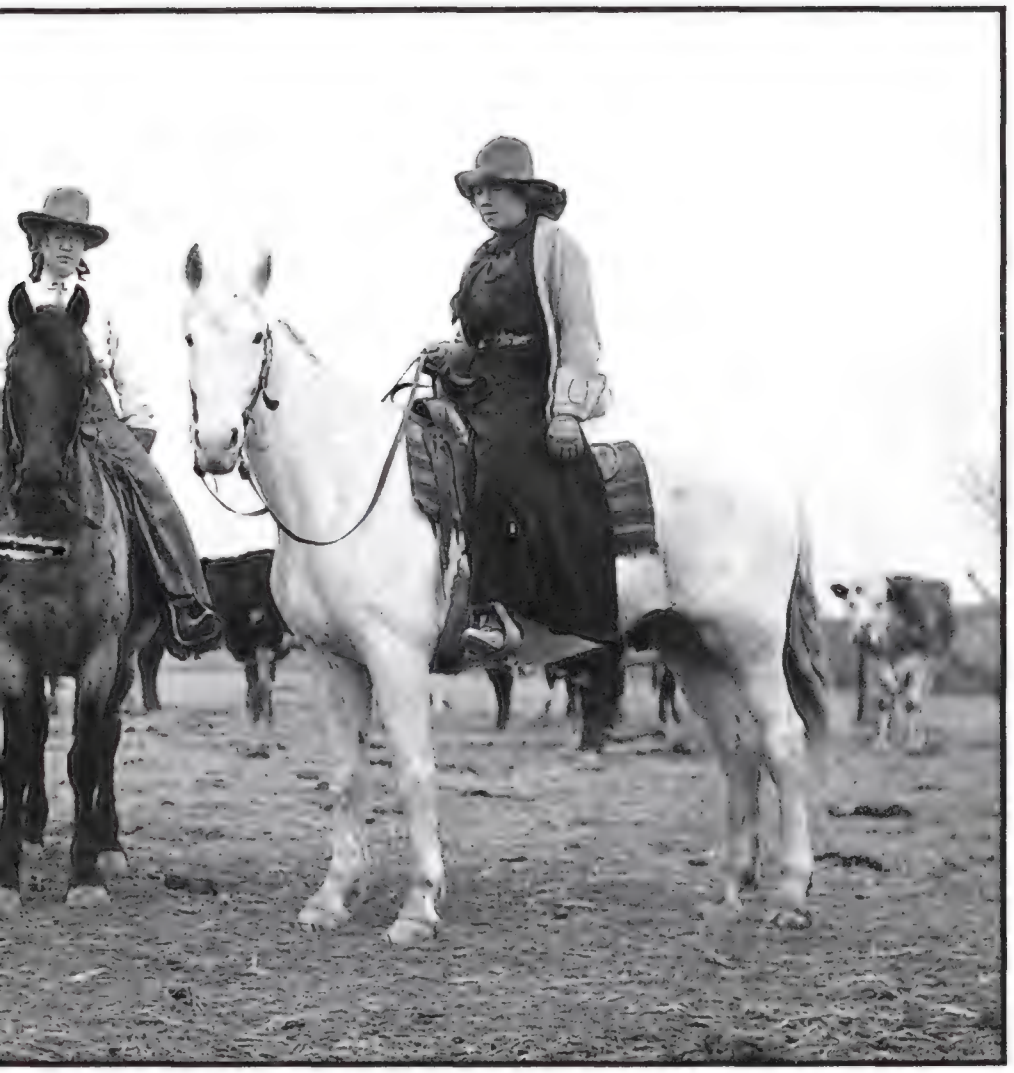
Her work was all but forgotten until an enterprising young journalist, Donna M. Lucey, came across references to it when researching the role of women settlers in the West. Evelyn's best friend had inherited her estate in 1928 and was fiercely protective. By gentle persuasion Lucey obtained permission to publish some of the 2,000 photographs, as well as excerpts from Evelyn's voluminous diaries and letters. Her stunning book, *Photographing Montana 1894-1928, The Life and Work of Evelyn Cameron*, which has just been issued by Alfred A. Knopf, contains 170 images, including most of those on these pages.

Jane D. Scholl

Of prime importance to homesteaders was working the land, but they also took pride in the tiny, fragile houses that provided them with mere minimum shelter, as well as in a man's skill at fetching in a jackrabbit. Among Cameron's favorite subjects were cowboys. She shot this steer-roping contest in Terry in 1910; Charlie Clement (watching from the horse on right) won, earning a whopping $65.

Among German-Russians who flocked to stake claims were Christina and John Krenzler, whose marriage Cameron recorded. They disliked her first picture, so she rode to their home to take this photograph. The Fourth of July was a very big celebration for all, cowboys and ranchers as well as homesteaders. One young woman left no doubt as to the occasion her costume commemorated.

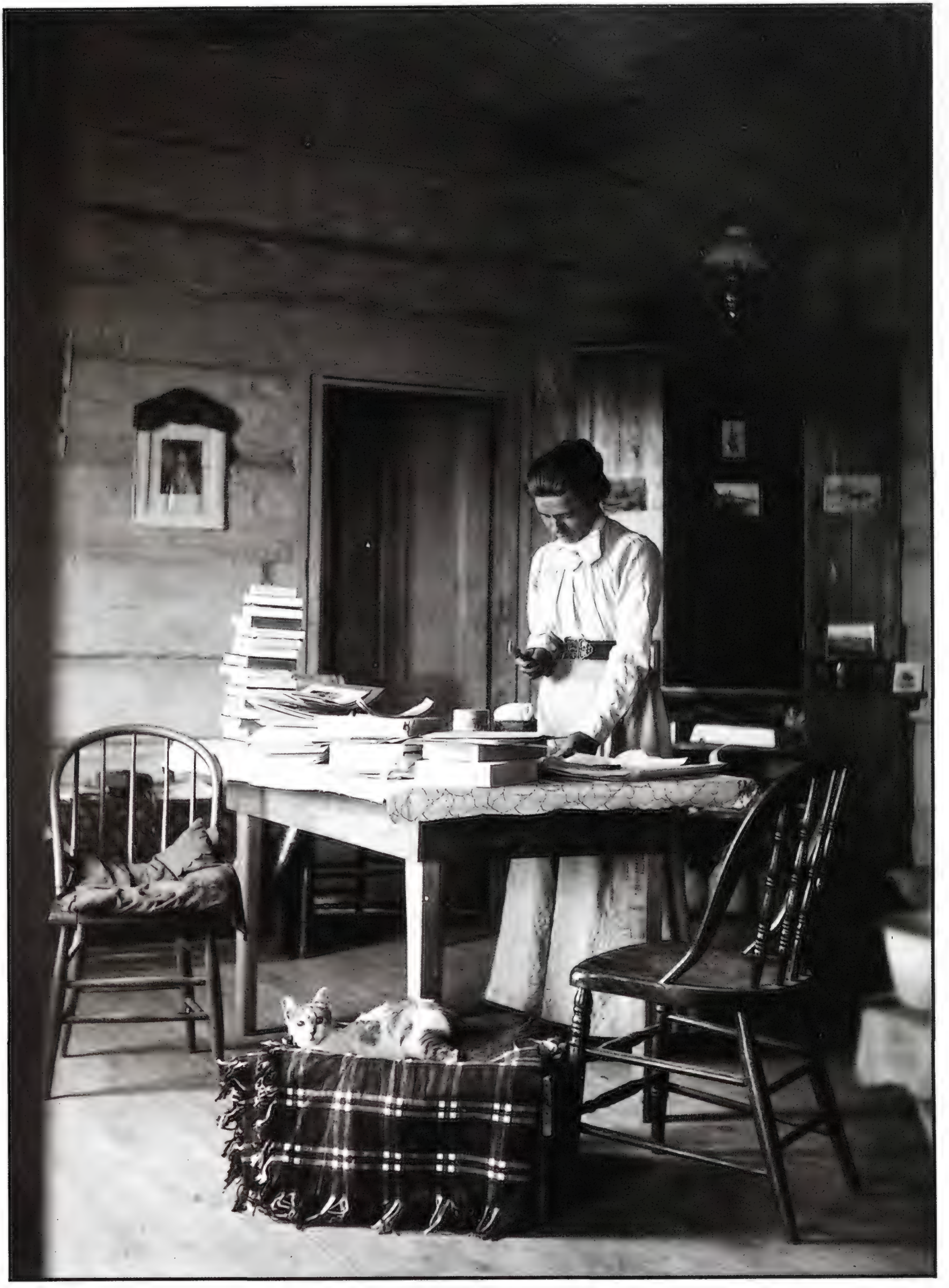
An innovative sheep rancher, George Burt, employed this steam-traction engine to lug some 25,000 pounds of wool to the Terry railhead. Portrait of Nels Undem, a Norwegian immigrant, shows the prosperous sheep rancher, with his border collie, carrying a lost spring lamb to reunion with its mother.



Nels and Sam Undem pay a visit to their sheep wagon (far left), where a herder lived spring to fall while moving Undems' flocks across the grasslands. The three Buckley sisters had a reputation for daring; their hair, and their expertise as horsewomen, won the cowgirls the nickname "Red Yearlings."

Cameron (opposite) mounts prints in her kitchen. She developed the glass plates at night, then printed them by day, using the sun as her sole light source. Without equipment for enlarging photographs, she could make only 5-by-7 contact prints.

Smug in Sunday finery, a mother and her daughter, with reluctant offspring, show off Cameron's incisive skill as a portraitist. Below, the general store and post office was a social center—as well as the entire town of Knowlton, Montana.



After Lumina satisfies what you need, it quickly responds to what you want.

GM *Excludes other GM products. †See your Chevrolet dealer for terms of this limited warranty. A deductible will apply after 12 months or 12,000 miles. Chevrolet, the Chevrolet emblem, Lumina and Corvette are registered trademarks and Chevy is a trademark of the GM Corp. ©1990 GM Corp. All Rights Reserved. Let's get it together...buckle up.

Lumina Sedan ■ *Family Circle* "Domestic Family Car of the Year."

■ Most passenger room in its class.* ■ Standard Scotchgard™ Fabric Protector on all seats and doors. ■ Corvette-inspired independent rear suspension. ■ Optional 3.1 Liter V6 with Multi-Port Fuel Injection. ■ 3-year/50,000-mile Bumper to Bumper Plus Warranty†

MORE PEOPLE ARE WINNING WITH THE *Heartbeat* OF AMERICA

TODAY'S CHEVROLET™

Lumina Sedan. It has everything you need...and then some. If you need passenger room, no other six-passenger sedan has more.* And to fight rust, Lumina's exterior corrosion protection can't be beat. Lumina also expects the unexpected and quickly gives you what you *want*. It inherited the exceptionally tuned ride of Corvette-inspired independent rear suspension. And no matter where you turn, the power of Lumina's available 3.1 Liter V6 engine and the confidence of four-wheel disc brakes help keep you in control and out of trouble. Chevy Lumina Sedan. A great many reasons more people are winning with The Heartbeat of America.

tional Gallery of Capodimonte, Naples

Danäe, the daughter of the king of Argos, was held prisoner in a bronze tower, then ravished by Jupiter in the form of a shower of gold, here shown as coins.

This mythological painting, with its clearly erotic nature, was commissioned by a member of the Farnese family in about 1546, during Titian's visit to Rome.

By Bennett Schiff

In Renaissance Venice, Titian was prince of painters

And he still is: an exhibition at the National Gallery of Art shows why he is revered as a master whose works go straight to the heart

This is how, on a good day, they order things in *La Bella Italia.* When an exhibition of the works of Titian opened in Venice this past spring the entire nation rejoiced. The opening was front-page news everywhere in the country. A thousand people in a contagious celebratory mood gathered in the courtyard of the Doges' Palace, itself a work of art. The day was perfect. The sun shone. Venice glittered, as it can, in its magical confectionary splendor. The President of the Republic spoke.

And this was for an artist who, for very nearly half a millennium, has never been entirely out of the Italian eye and mind and, witnessing the reception, the Italian heart. It was not art auction news. It was human news; an emotion, a feeling.

It isn't often that things happen this way. But it is as it should be. Because in the garden that is the paradise of the grandest painters of the Western world, a glorious patch is reserved for Tiziano Vecellio—called Titian. Leonardo is there, Michelangelo, Velázquez, Rembrandt, Vermeer, Goya, Cézanne, Van Gogh. They are all there, and others; each of them for a time—and perhaps forever—is the greatest painter of all time. Who *is* the single greatest painter of all time? All of these, of course.

They have a way of lasting. For more than 400 years, without deflection and without defection of taste, Titian has been given his due. Unlike so many others, whose reputations faded—Vermeer, for example, who was entirely out of sight for roughly 200 years and had

to be rediscovered and resurrected—Titian has remained in the very forefront of the public's two divergent eyes, one popular, the other scholarly. Everyone's painter, you could say. There is something there for all. With the masters it can even be the same thing.

His is one of those magical stories. From the moment he picked up a pencil, then a brush, it was clear that he was extraordinary. He never faltered. He was acclaimed from the beginning, then revered. The Holy Roman Emperor, Charles V, the story goes, bent to pick up a brush Titian had dropped. It may even have happened. It was said of him by that other genius Giorgione, with whom he probably had studied, but whom he certainly knew, that he was an artist while still in his mother's womb. Some doubt that Giorgione actually said it, but you can be fairly certain, after some of the young Titian's work was mistaken for his, that he thought it.

In any event, and this is a major event, an exhibition entitled "Titian, Prince of Painters" is on view from October 28 through January 27, 1991, at the National Gallery of Art in Washington, D.C., having made the trip from the Doges' Palace in Venice. It is, as these shows can go, not immense. There are about 50 paintings. (What, only 50 Titians?) And they are very special Titians, carefully chosen, expertly courted from among the world's foremost museums and private collections.

A number of the canonical masterworks are missing, but it is nevertheless very much a choice show. It celebrates the quincentenary of Titian's birth, and it is the first major showing of his work since 1935, more than half a century ago, also in Venice. It is by far the largest ever to be seen in this country. In fact, remarkably, it is the only significant one-man showing of his work ever to have been mounted in the United States.

He was perfectly poised at that juncture in the Italian High Renaissance when the artist's station in society was raised from craftsman to creator. Titian was superbly endowed to take advantage of the moment.

Kunsthistorisches Museum, Vienna

Il Bravo, circa 1515-20, like many of the early works by Titian, was long thought to have been painted by Titian's teacher, Giorgione. The identities of the two men, one of whom confronts the other with a concealed weapon, is still a subject of debate among scholars.

Uffizi Gallery, Florence

In the mid-1530s, a period when appearance and court ceremony were paramount, Titian painted the *Portrait of Eleonora Gonzaga della Rovere*, Duchess of Urbino. Once Titian's fame was well established, public figures vied with one another to have him render their likenesses.

And never was there anyone more willing to run with the ball. He was sought by and painted emperors (Charles V), kings (Philip II of Spain), queens (Mary of Hungary), popes (Paul III), dukes and their duchesses, more ordinary nobles, and merchants who in that Venetian republican society were as powerful as anyone. He moved easily enough among them. He was his own kind of aristocracy.

He was born in Pieve di Cadore, a village in the Alps, on the other side of the Austrian Tirol, about 70 miles north of Venice, in what is now accepted by authorities to be sometime between 1488 and 1490. For many years it had been thought he was born ten years or so before that. He came from a family of lawyers and soldiers. He was one of five children. We can assume he had a comfortable childhood. An early biographer says he painted a Madonna on the side of his house with the juice of crushed flowers. It's a pretty story, and we can choose to believe it as easily as not.

It helps to put the times in perspective to consider that Titian was about 4 when Columbus stumbled onto the Americas. Titian got to Venice (in which he continued to live until his death in 1576) when he was 9 or 10, in order to take up an apprenticeship as a painter. In that place in those days there was no nonsense of parental objection to art as a career. As a parent you might consign a son to an artist's workshop as readily as you might attach him to a furniture maker. Titian was sent to live with a relative in Venice and went to work in the shop of the mosaicist Sebastiano Zuccato.

He proceeds then from one master to another, according to his contemporary biographers, Lodovico Dolce and Vasari, the indispensable, but not always dependable, Boswell of the scintillating galaxy of Renaissance painters. From Zuccato to Gentile Bellini, to his brother, the master Giovanni Bellini, to Giorgione, the dreamy and poetical genius who was lost in the plague of 1510 while still in his mid-30s. He apparently doesn't stay that long with any of them. He shops around. At a very early age he is out on his own, already rich in talent and inflexible in purpose.

Venice at the turn of the 16th century was still at the height of its powers, a unique republic in a region

Trustees of the National Gallery, London

The serenity of the landscape and the balance of yellow against dark blue mirror the subtle, calm intimacy in the artist's *Madonna and Child with Saint Catherine and the Infant Baptist*, from 1530.

dominated by principalities, where a well-allied pope commanded from Rome. Founded, according to legend, in the marshes in A.D. 421, it had lasted for more than a thousand years, a wealthy and proud society, a colonial power, the fulcrum for trade between East and West.

Called a republic, it was in fact an oligarchy. Curiously known as *la Serenissima* (Most Serene City), it was the scene of almost constant warfare and labyrinthine intrigue. In the 13th century it had limited membership of its Great Council to the patrician families of the city, who in turn elected the Senate, the policy-making organ of the government. There was a Council of Ten, a sort of KGB, which looked after state security. An elected doge from within the ruling body commanded all.

By 1508 Titian had received a commission to paint one side of the Fondaco dei Tedeschi, the important German trade center. The other side had been painted by Giorgione. Both walls have been largely destroyed, but some remnants by Titian are presented in the show, shadows of heroic figures, of interest to the many Titian scholars for the new sense of monumentality they present and in which the presence of Giorgione, as mentor, is discernible.

These are Titian's early years. He has learned about presenting reality from Giovanni Bellini. About form and shading and emotiveness from Giorgione. About color from both. And to all he has added the unique genius evident from the beginning, a vibrancy that inhabits every square inch of a painting and that can startle you.

By 1513 Titian is ready to make a bid to become the chief painter of Venice. Bellini is in his 80s. Giorgione is dead. Titian addresses a petition to the Council of Ten to decorate a large wall in the Doges' Palace. He has received an invitation to go to Rome's Papal Court, he informs the mighty Ten, but would forgo it for the wall. He knows that such a commission would advance him to the position of principal painter of the republic, successor to the revered Bellini. He has "given" himself, he writes, "to learning the art of painting not so

Bennett Schiff, who is a member of SMITHSONIAN*'s Board of Editors, wrote most recently about artist Joseph Wright of Derby, in September 1990.*

BERMUDA SHORTS

ON OUR WONDERFULLY WARMING WAYS.

TODAY'S FORECAST:

FLURRIES OF

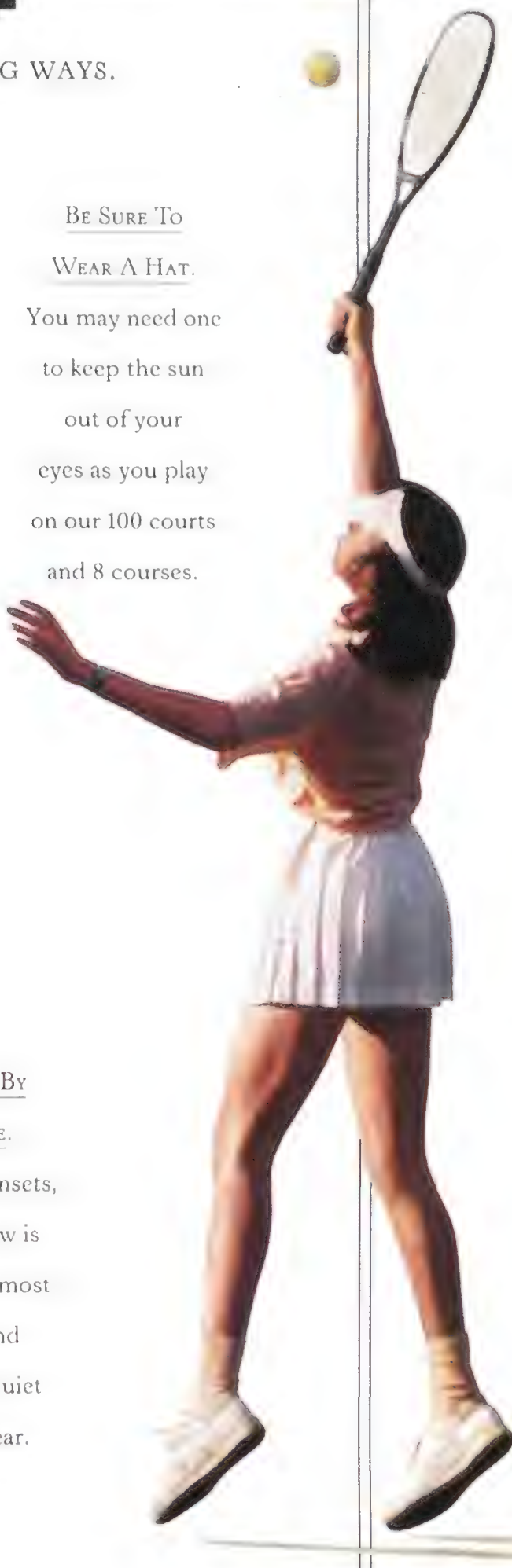
FLOWERS.

With temperatures around a balmy 68°, our little island stays green and growing all through your fall and winter.

BE SURE TO

WEAR A HAT.

You may need one to keep the sun out of your eyes as you play on our 100 courts and 8 courses.



CURL UP BY

THE FIRE.

Our fiery sunsets, that is. Now is Bermuda's most serene and blissfully quiet time of year.

Call your travel agent or 1-800-BERMUDA.

BERMUDA. A SHORT TRIP TO THE PERFECT HOLIDAY.

much for the desire to earn money as for the attempt to acquire a small fame; and being counted among those who currently make a profession of art."

With smooth Venetian politesse, he points out that he is being "urgently pressed by His Holiness the Pope and other Lords to go and serve them: So desiring as a most loyal subject to Your Magnificences to leave some mark in this glorious City, I have decided, thinking thus, to be so bold as to offer myself to paint in the Maggior Consiglio and to place all my skill and wit that I have so far gained. . . ." The implication is clear: if they don't take up his invitation, off to Rome he goes.

He got the job eventually and began work on the wall in 1516. Bellini had died that year and Titian had succeeded him as painter to the republic, a position he honored as Bellini had before him. After putting the project aside for 25 years, he completed it in 1538.

It is likely that what made him put off the Doges' Palace wall was a commission to paint the high altarpiece for Venice's largest church, Santa Maria Gloriosa dei Frari, known with affectionate familiarity as the Frari. He then proceeded to paint a stupendous work, one of the world's treasures, the *Assunta*, or *Assumption*. That work is not in the show, but those fortunate enough to have seen the exhibition when it was at the Doges' Palace could then walk through the city to the Frari to be graced by the *Assunta* (pp. 77-79).

Louvre Museum, Paris

A brilliant composition, *Man with a Glove*, c. 1523, lacks psychological tension of Titian's later portraits.

Titian's paintings, portraits, mythological subjects, nudes, scenes and stories from the Bible and classical literature, are epic productions, works of a prodigious talent. Come into a darkened room, with the light just right as it was in the Doges' Palace, and as it is in the National Gallery, and the paintings blaze out with reality and presence and magic too. One masterpiece after another confronts you: *Man with a Glove*; *Francesco Maria della Rovere*, Duke of Urbino; the duke's wife Eleonora; *Pope Paul III*; *Doge Andrea Gritti*; a self-portrait.

No sense of color being applied

There is no simpering religiosity in his paintings from the Bible. His angels, Madonnas, saints, prophets, Christs, are presented in dignity and a profound humanity. It is Titian's majesty that, in the end, is so calming. The show is subtitled "Prince of Painters." Well, it's alliterative. But, it doesn't signify his regal ranking. He needs to be raised a notch or two.

He is a supreme colorist. There is no sense of color being applied. It never shouts, doesn't obtrude. It seems to flower out of the surface, making shapes, making volumes, growing out of itself, blooming. There is a reddish-gold hair color that has come to be known as "Titian." But, it is his use of orange that is most compelling; a muted orange, it is almost always present somewhere, from entire backgrounds to a trace, sometimes turning to gold, sometimes suggesting a tinge of earth. There is something elemental in this kind of painting, a profound and basic discovery of what a man can do to project a force.

His nudes (how innocuous *Playboy* is in comparison) are naked. They languish. They lure. They live. They conquer. They seem perfect for what they are and are meant to be.

What is perfect, of course, is the art of Titian's painting, as in the Frari, looking at the *Assunta*. It is the nobility and monumentality of the work that makes it so different from a grand-opera curtain. It could, of course, serve as that, but it is so very much more, as a revolutionary work for the time and as a continuing world masterpiece of dazzling virtuosity and emotional grace.

A Titian painting is an announcement, a pronouncement, an event. There is emotional grandeur, stature, spaciousness, an Olympian presence. And yet his approach to almost 70 years of steady production (he sometimes had four paintings on easels at the same time) was at bottom pedestrian. No businessman, no merchant, no accountant, was more precise in keeping his accounts and seeking payment than Titian. Living in the most tempestuous times, rubbing elbows with the rulers of the day, some of the most colorful, devious

Listen to your heart.

Make the Healthy Choice.®

Lean meats, light sauces, wholesome fruits and vegetables. When you know what's good for your heart.

BRAND DINNERS (Line Averages)	FAT (% of calories)	SODIUM (mg)	CHOLESTEROL (mg)
Healthy Choice®	**12**	**385**	**48**
Le Menu®	39	985	N/A
Le Menu® LightStyle	23	732	58
Budget Gourmet®	41	1044	81

© 1990 ConAgra, Inc. Le Menu® and Le Menu LightStyle® are registered trademarks of Campbell Soup Co. Budget Gourmet® is a registered trademark of the All American Gourmet Co

National Gallery of Art

Goddess' gentle modesty in *Venus With a Mirror,* mid-1550s, is offset by the feast of sensual textures—wine-colored velvet, fur, pearls. Not surprisingly, the artist kept this work until his death in 1576.

and even murderous personages of the time, Titian remains somewhat remote, a kind of anxious tradesman.

His correspondence is stunningly dull, sycophantic and even, in the manner of the time, groveling when he addresses Charles V, his son Philip II of Spain, his sister, Mary, Queen of Hungary; a pope or any of the various dukes, their children and consorts he memorialized for the ages, significant today for being painted by Titian rather than for who they were then.

Veiled by the distance of time

There is a great deal of Titian's correspondence intact, none of it interesting, except to the many scholars who, through the ages and still, have made an industry of analyzing and speculating on his work. The man himself is veiled from us, perhaps even more because much of the writings may not be his; his transcribers and advisers seem to have contributed material for Titian's signature.

A good deal of the time he is imploring his mighty clients to pay their bills. The remainder of the time he spells out projects in hand that they might be interested in buying. He asks for a job for a wayward son. He kisses their hands. He is reverential of their very magnificent beings. He gets along. He sells many paintings. He receives many commissions. In 1548 he travels to Augsburg, Charles V's current seat of government in Bavaria. He spends six months living in the Vatican, painting the Roman Catholic hierarchy, the pope and his nephews.

He travels to the main cities and courts of Italy, painting the ruling families: the d'Estes of Ferrara, the Gonzagas of Mantua, the della Roveres of Urbino. He receives at home, a gathering place for intellectuals, poets, writers, publishers (in the last five years of the previous century, a quarter of all books printed in the world were printed in Venice). He is married to wife Cecilia. He has two sons: Pomponio, a priest and a scoundrel, frequently in debt or in trouble; Orazio, dutiful and good; and a daughter, Lavinia, who is beautiful and loving. Orazio is a model son who helps his father in the studio and acts as business manager.

Titian would have made his way into the households of the nobles in any case. But the path was made much easier by the intervention of Pietro Aretino who, having fled Rome at about the time that it was sacked by Charles V in 1527, took up his fortunes in Venice, where he soon perceived Titian's remarkable genius.

Aretino, son of a cobbler, was a brilliant satirist, polemicist, poet, dramatist, wit, sensualist, a colorful rogue of genuine talent. His pen was so feared, and his information so accurate, that many of the mighty paid to keep him from going public. Until his death in 1556, he remained a close and trusted friend of Titian's.

Within three months of his arrival in Venice, Aretino had his portrait painted by Titian and arranged for the painter to send it to a former patron, the Marquis of Mantua, Federico Gonzaga, along with a portrait of Charles V's ambassador to Venice, both free of charge and accompanied by an adoring letter signed by Titian. All sorts of commissions followed and, in time, an introduction to Charles V.

In time Titian's house in Venice became the center for a good deal of the city's intensive intellectual life. Aretino was often there, as was another refugee from Rome, the architect and sculptor Jacopo Sansovino. In 1540, the Latinist Priscianese, who had come to Venice to publish a book, was invited to Titian's house. Aretino and Sansovino were there and the historian of Florence, Jacopo Nardi. The Latinist appended a letter to his book, describing the scene.

"There were assembled with the said M. Tiziano, as like desires like," Priscianese wrote, "some of the most celebrated characters that are now in this city, and of ours chiefly M. Pietro Aretino, a new miracle of nature, and next to him as great an imitator of nature

Prado Museum, Madrid

Paintbrush in hand, Titian in his *Self-Portrait* from 1565-67 seems to be reflecting on his prolific career.

with the chisel as the master of the feast is with his pencil, Messer Jacopo Tatti, called il Sansovino, and M. Jacopo Nardi, and I; so that I made the fourth amidst so much wisdom." The guests wandered through the house looking at paintings "of which the house was full," and discussed the beauty and charm of the garden. And then, sitting in the shade of the garden as the light faded, they watched as the gondolas came out on the lagoon "adorned with beautiful women, and resounded with the varied harmony and music of voices and instruments, which till midnight accompanied our delightful supper."

By all accounts, and they are many and not always in agreement by any means, Aretino and Titian were perfect progenitors for the Odd Couple. The painter, not that articulate, at least with the language, anxious, an obsessive worker and worrier, stickler for tradition in all matters—excepting art, of course, which his genius radicalized. The writer, a polychromatic extroverted freewheeler in permanent overdrive, whose house was a favorite gathering place for various of the celebrated courtesans of Venice. Several of them were given the collective noun of *Aretine* as a title, and at least one may have been the model for Titian's indelible and life-enhancing nudes, prime examples and elucidators of that basic subject, it seems, for all time.

Prostitutes were a prominent fact of life in 16th-century Venice. According to Marino Sanudo, a patrician of the city who kept a meticulous daily diary of life there that comes to 58 volumes, there were 11,654 prostitutes in Venice in the early 16th century among a population of about 115,000, or a little more than 10 percent. Sanudo attributed this proportion not only to a general loosening up of morals but to the arrival of refugees from the mainland due to one scourge or another of the time. And the government was also inclined to leniency, it was said, because of the traditional fear local husbands had of being cuckolded by single men.

Aretino's life was continually eventful. Following a luscious banquet at Titian's house—Titian's banquets often featured delicacies sent to the painter by his admirers on the mainland—Aretino acknowledges receipt. He addresses one benefactor as "most kind, most dear and most gracious Messer Niccolò . . . Because it seemed most ungrateful to Titian who gives life to color, and to Sansovino, who imbues his marble with breath, merely to thank you for the gift of pickled fennel and spice cakes, they, together with myself and the other witnesses of their appetites . . . declare how much they are beholden to you."

Aretino died in 1556, reportedly during an apoplectic seizure of laughter upon hearing a salacious joke about his sister. No doubt the story is made up, a Venetian joke, exactly the sort Aretino himself was justly famous for. He could have written his death scene himself.

Titian's daughter had married and left the house the previous year, and was to die a few years later. His wife had also died. Titian, more than ever, threw himself into his work. The days of lavish parties had ended.

Titian was a perfectionist. Describing his technique to a biographer, a student of Titian's said that Titian "used to turn his pictures to the wall and leave them there without looking at them, sometimes for several months. When he wanted to apply his brush again he would examine them with the utmost rigor, as if they were his mortal enemies, to see if he could find any faults; and if he discovered anything that did not fully conform to his intentions he would treat his picture like a good surgeon would his patient, reducing if necessary some swelling or excess of flesh . . . and if a foot had initially been misplaced correcting it without thinking of the pain it might cost him. . . ."

Filmy veils and thick, fatty layers of paint

In his last years Titian created some of his most moving paintings with an ever evolving technical mastery and an unassuaged appetite for new ways of dealing with a flat surface. He had taken the very substance of painting, oil, a comparatively new way of painting introduced in Venice the previous century from Flemish artists, and had advanced it as far as it would ever go. It was Titian, wrote John Canaday, "who brought oil into its full development. Its fluidity, its adaptability to application in a filmy veil or in thick, fatty layers, in a smooth surface or a rough one, and in combinations where one form of application was played against others—its variety of texture, full range of color, and the freedom it allowed the brush, transforming it into an instrument of drawing like an enlarged

Church of the Jesuits, Venice

The *Martyrdom of Saint Lawrence*, altarpiece for the Church of the Jesuits in Venice, was begun about 1547, soon after Titian returned from Rome, where he painted the Papal Court. Typical of Titian's late style, the brushstrokes are broad and energetic, and there is a strong play of light and shadow, imbuing the work with mystery. It was finished in 1558.

← Fold out

Santa Maria Gloriosa dei Frari, Venice

The majestic *Assunta*, or *Assumption*, of 1518, altarpiece for the Church of Santa Maria Gloriosa dei Frari, was Titian's first public commission in oils. The monumental figures and the color-drenched atmosphere of his early style shocked the Frari Brothers, who decided to keep the masterpiece only after the Imperial Ambassador attempted to purchase it.

Metropolitan Museum of Art

In *Venus and Adonis*, painted in 1560-65, the goddess tries in vain to restrain her lover from leaving for the hunt. Titian produced several versions, all of which were extremely popular; 30 painted or engraved copies are now known.

pencil or pen—all these characteristics of oil became with Titian an integral part of expression as the luscious materiality of his paint fused with the sensuousness of his imagery."

The late works are summations of the man's remarkable talent made efflorescent by the kind of radiant blaze that can come to the great creators in their final years. Titian attained this, wrote Bernard Berenson, "by the almost total suppression of outlines, by the harmonizing of his colors, and by the largeness and vigor of his brushwork."

The broad strokes of the brush had replaced contiguous planes of color. Even the colors, as the eminent art historian Johannes Wilde pointed out, had been "split up and dismembered, and have been distributed in small particles all over the picture space. . . . Not the smallest point in it has been left neutral; and, potentially, every single brush stroke contains all the colors of the picture."

His late style was so energized that his retouching process "involved his moderating here and there the brightest highlights by rubbing them with his fingers.... In the last stages he painted more with his fingers than his brushes."

All this is delivered in a stunning hammer blow to the solar plexus by Titian's *Martyrdom of Saint Lawrence* (pp. 75-76), another late-period altar painting of overwhelming emotional impact borrowed from Venice's Church of the Jesuits for this exhibition. Agony, pity, the hope of heaven are all here in simplicity and in grandeur, shadowed, light-infiltrated, all condensed and yet flowing in one of the world's most profoundly moving and elemental masterpieces.

He had anticipated the Impressionists and the Post-impressionist Cézanne. And, he had been the master from whose works Nicolas Poussin, Rubens, Velázquez, Rembrandt, Goya, Delacroix and Renoir learned. As artistic genealogies go, this is one of the most formidable.

Two years before Titian's death, the new king of France, Henri III, came to Titian's home to pay his respects. It was at about that time that the venerable artist had asked the Brothers of the Frari for permission to be buried in a chapel of the church. In return for the favor he would paint a Pietà for the church. The work, which is as moving as any ever painted, was almost completed at his death. He died during the plague of 1575-76, which took the lives of 50,000 out of a population of 175,000.

He had painted two self-portraits in old age. In one he is a sort of priestly figure. In the other he is a kind of monarch. He was both.

The formidable inner strength of Doge Andrea Gritti, c. 1546, is captured in Titian's energetic brushwork.

HIGHEST SAFETY RATING OF ANY CAR OVER THE 1988-1989-1990 PERIOD.*

MERCEDES-BENZ RANKED THE MOST DEPENDABLE CAR IN AMERICA.†

AMERICA'S MOST IMPRESSIVE RECORD OF RETAINED VALUE.**

THE WORLD'S MOST DURABLE CAR.††

*Highway Loss Data Institute, 1988, 1989 and 1990. † J.D. Power & Associates Vehicle Dependability Index Study Of Original Owners. Based on things gone wrong to 4- to 5-year-old model vehicles in the past twelve months. **Over a ten-year period, Mercedes-Benz cars, as a line, have retained a higher percentage of original value than any other make. Urban Science Applications, Inc. Model Years 1978–1987. †† A 1957 Mercedes-Benz 180D, with over 1,184,880 miles, cited by the *Guinness Book of Records*. © 1990 Mercedes-Benz of N.A., Inc., Montvale, NJ.

Luxury car breakthrough: deeds, not words.

ENGINEERED LIKE NO OTHER CAR IN THE WORLD

For more information call 1-800-242-7878 or visit your authorized Mercedes-Benz dealer.

By Doug Stewart

New machines are smaller than a hair, and do real work

Silicon machinery with microscopic parts is already in our cars, and may soon be at work all around us, even in our bodies

Richard Moroney, a 25-year-old graduate student at the University of California, Berkeley, is trying to build a microscopic electric motor, known in the engineering world as a "micromotor." Its key moving part, a block of silicon, is smaller than a flake of dandruff. "Occasionally it gets stuck," Moroney says of the microblock, "and I have to tease it with a hair to free it up." Moroney can frequently be seen in his windowless cubicle in Berkeley's Sensor & Actuator Center ("B-SAC" to its denizens) plucking hairs from his scalp and gluing them to short lengths of wire. If his nudging is too energetic, the unattached block flies off into oblivion. "Microtiddlywinks," he says with a shrug.

In the emerging world of micromachines, a human hair is a blunt instrument. Eyes without microscopes are useless. Sneezing is to be avoided at all costs. Researchers at labs around the country in the past two or three years have succeeded in building a host of machines with moving parts smaller than a fly's foot: gears, springs, slides, levers, tongs and diaphragms that are virtually invisible to the naked eye.

Miniaturization is nothing new, of course. It's given us tiny computer circuits and, as a result, tiny tape players and calculators. But the emerging field of micromechanics is something else again. Micromachines don't just shunt electrical signals around circuit boards; they do real work. Flaps flap, gears whirl and tweezers pinch. "Mechanical assembly is at the stage that electronics was 30 years ago," a National Science Foundation panel recently reported, "ready for a revolution in technology and size." Sums up Prof. Stephen Jacobsen of the University of Utah: "Small things can be faster, they can be cheaper, and they can do a whole bunch of things that big things can't do at all." Researchers speculate about building planetary probes, the size of mites, that would instantly analyze bits of Martian soil, and they muse about sending microdevices into the bloodstream to find, catch and pop disease-causing cells, one by one.

Although such tools are a long way off, the microgadgets that are already up and running are anything but primitive. At B-SAC engineers Bill Tang and Reid Brennen show me one of the diminutive subjects of their current research. On a glass slide beneath a large binocular microscope is a paper-thin square of silicon the size of a small button, called a die. The die is chock-full of machines, dozens of them, Brennen tells me as he centers one of them under the lens. Looking through the eyepiece, I see a huge set of "dentures" next to a large "safety razor blade" (p. 86). Connecting them is what appears to be a taut strand of dental floss.

Tang switches on the power, which makes the teeth start chattering. That in turn gets the single protruding rod vibrating. The razor blade is now flailing violently at the far end of the rod, like an elephant whipping back and forth at the end of a flagpole in a hurricane. At well over 10,000 vibrations per second, the motion is too fast for my eyes to follow under the microscope. Each time Tang switches on the power, the razor blade simply turns blurry.

Micromotors that can act as sensors

The device that Tang and Brennen have built is a microresonator. Like pendulums and tuning forks, a resonator, once electricity gives it a push, will vibrate naturally at precisely the same rate unless the conditions around it change. Says Tang, "It can act as a sensor because it lets you measure variations in the environment." Modified, it could detect and identify chemical vapors from a toxic gas leak, for example. Or it could keep tabs on precisely how much each part of a new rocket engine vibrates. "This is a very, very long structure," says Brennen, pointing to the resonator's magnified image on a videoscreen hooked up to the microscope. "The whole distance from here all the way to here is about 700 microns." A micron is a millionth of a meter. Brennen, who worked as a carpenter before coming to Berkeley seven years ago, has clearly scaled down his view since then of how long "long" is.

Photographs by Peter Menzel

At MIT, researcher peers through scope at wafer loaded with 7,000 micromotors, like one projected behind him.

Berkeley engineer Reid Brennen has developed a denturelike microresonator: the chattering of its "teeth" turns a device that functions as a sensor to detect such things as gas leaks or heat changes.

Relatively speaking, of course, the structure wiggling at the end of the rod is gigantic. The pole itself is only two microns wide; a bundle of several hundred such poles could fit inside a human hair. That the mass at its tip doesn't snap off is a tribute to the mechanical properties of silicon. "At this scale, silicon is stronger than steel," Tang says.

The excitement in the engineering community that micromechanics is inspiring stems largely from a lucky coincidence: this same stronger-than-steel substance happens to be what computer circuits are already made from. As a result, the micromachine makers have been able to borrow the know-how that computer makers have worked so hard to accumulate over the past 20 years. "One of the big issues in trying to make things small is to get the parts together and then hold them together," says Prof. Richard S. Muller, B-SAC's cofounder and codirector. "A fastener can be easy to use when it's at a scale that our thumbs can get at. But when it gets very small, you just can't handle the parts." Even if you could, he adds, the parts would likely be crushed during handling.

Unlike the way Swiss watches are made, silicon micromachines are built in one piece and ready to go. Their three-dimensional structures are created by stacking up a series of very thin, carefully detailed layers of silicon, each one deposited directly on the layer before. As a final step, acid etches away the in-between "sacrificial" layers to free the moving parts. In 1988, Berkeley's Long-Sheng Fan and Yu-Chong Tai did just this to create the world's first rotating micromotor. To keep its freely moving rotor from spinning away like a Frisbee once it was activated, Fan and Tai sculpted a mushroom-shaped hub, layer on layer, that kept the rotor anchored.

The big advantage of micromachines, Muller points out, is not that they're smaller per se. It's that their size and mass-producibility make them cheap. "You can put as many devices on a chip as you can crowd together, and it costs no more," Muller explains. As long as you're making one device, you might as well make a thousand. And you could then put them to work in large numbers for built-in redundancy. In hard-to-reach places like undersea fiber-optics cables (which need mechanical switches), making sure your backups have backups beats sending a repairman. And designs are simplified when electronic and mechanical parts are hard-wired neighbors on the same chip.

For Doug Stewart, a regular contributor, the scale of micromechanics was a change from his last subject, huge, hand-painted billboards (September 1990).

The 3-D structures that a clever engineer can make by using layers of silicon are only starting to be explored. In the Berkeley lab, graduate student Carlos Mastrangelo has just built the world's smallest light bulb. He did so by etching away a narrow trench in a silicon chip, leaving only a wispy sliver of silicon that runs down the center and is supported at either end. Covering the trench is a transparently thin membrane of silicon nitride, which maintains a vacuum.

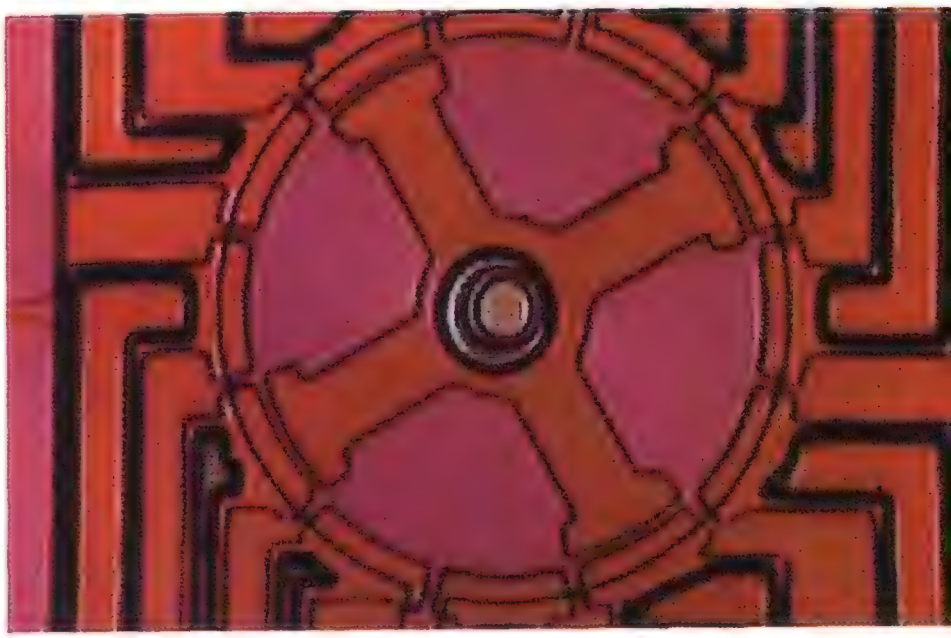
"A dust particle can really mess things up"

In the center of Mastrangelo's microscope stand, two malevolent-looking steel probes hold one of his little chips pinioned to a glass slide. (The probes provide a conduit for electrical current from a nearby power source.) Once the room's fluorescent lights are out, I notice that a speck midway between the probe tips is blinking eerily on and off. The tableau suggests a pair of praying mantises preparing to eat a radioactive lunch. "Most microstructures are extremely fragile. A dust particle can really mess things up," Mastrangelo says in the darkened room. "But this light bulb is completely sealed." Should anyone doubt his word, he keeps an assortment of water-filled petri dishes on a nearby lab bench, next to a hand-lettered sign: BIOLOGICAL EXPERIMENT AREA. Ignoring the ribbing of his labmates, Mastrangelo dips an eyedropper into a petri dish, then carefully places a droplet on his blinking chip. Through the microscope, I see one-celled paramecia and the odd bacterium drifting around Mastrangelo's light source. An ordinary drop of water would do, he concedes, but the paramecia are much more convincing under a microscope.

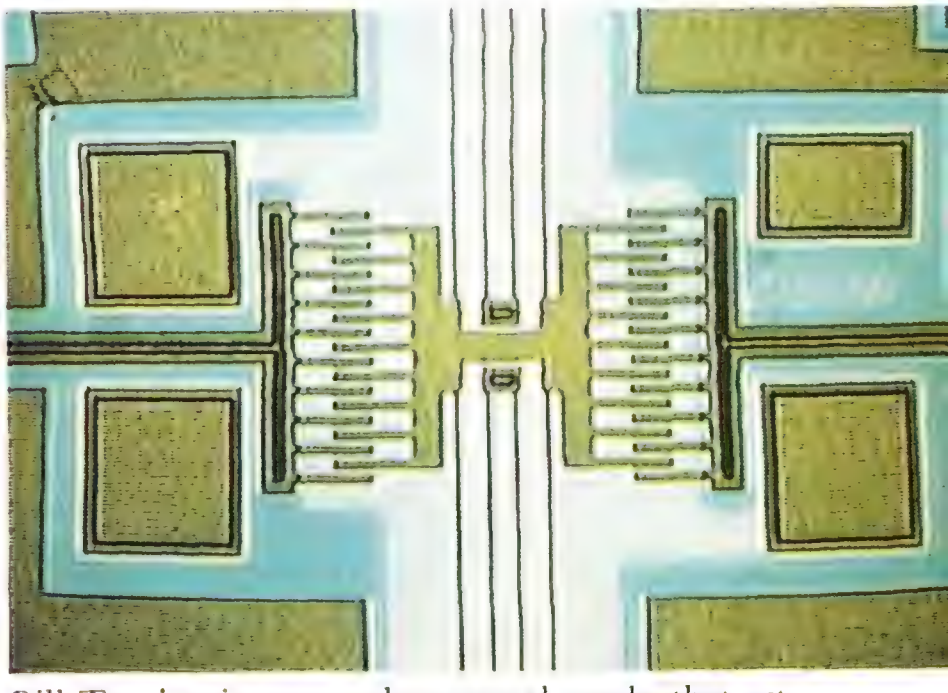
For now, Mastrangelo's incandescent microlamp is a curiosity, but arrays of ultrasmall light bulbs may someday turn up in television sets to yield pictures as sharp as photographs. A more immediate use, suggests Professor Muller, might be in conducting while-you-wait biopsies. The telltale sign of a tumor can be indicated by the amount of light that passes through the tissue. Using a two-pronged hypodermic needle with a light bulb on one tip and an optical sensor on the other, Muller says, a doctor might instantly check out a suspicious subcutaneous area without snipping flesh and sending it to a lab.

The Berkeley researchers realize that their micromachines are a departure from the age-old trend toward ever bigger, ever more muscular machines, be they bullet trains or the Hoover Dam powerhouse. "Historically, the bigger a structure has been, the more beautiful it has seemed, like the Golden Gate Bridge," Bill Tang says. "The concept of tiny machines is a new idea. Twenty years ago, you had transistor radios you could put in your pocket. But no one ever imagined

Early MIT micromotor, devised to study friction, has central rotor, turned by pulses of static electricity.

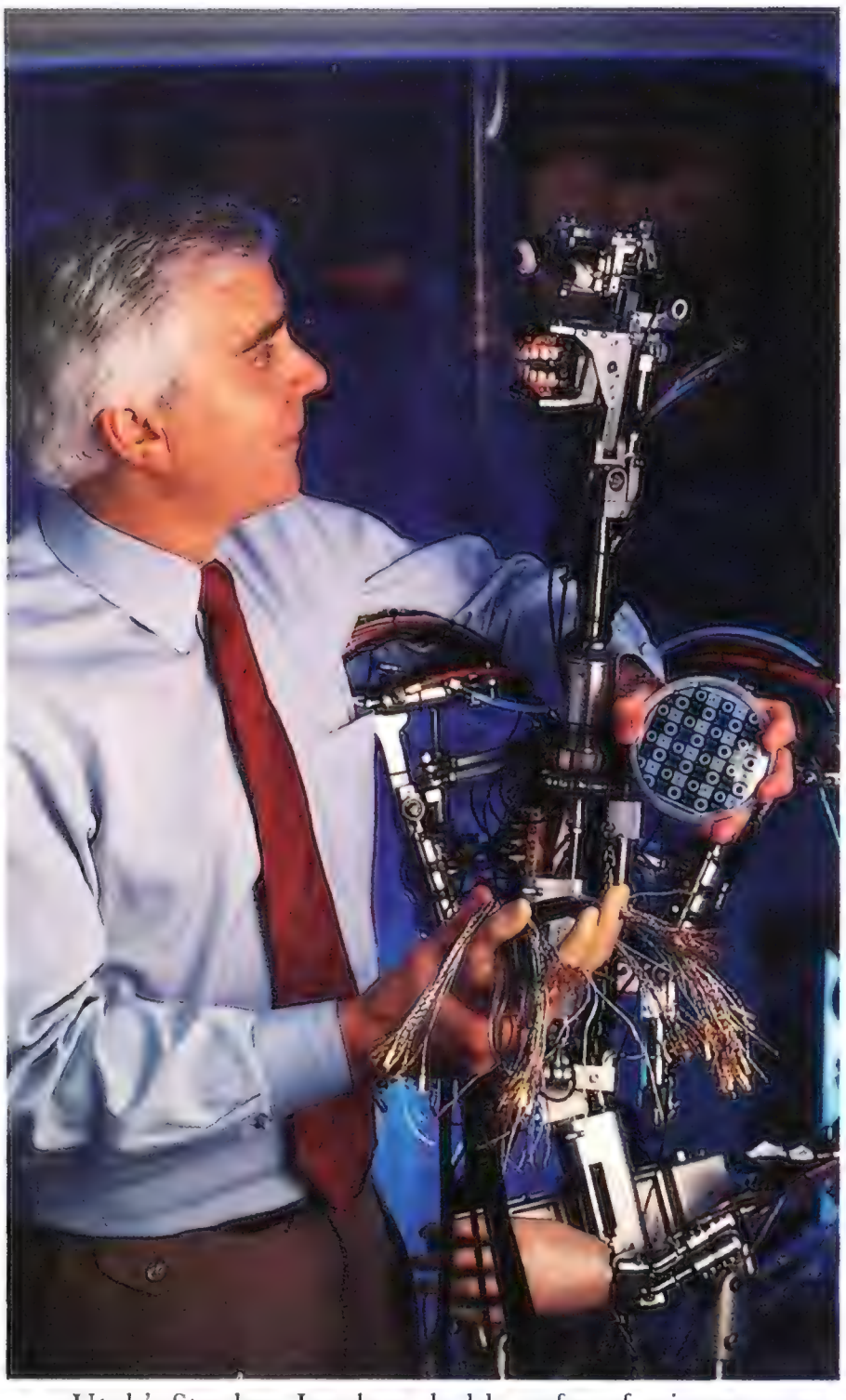


Earliest working micromachine, developed by Berkeley graduate Yu-Chong Tai, had a turning central rotor.



Bill Tang's micromotor has central combs that act like tuning forks; future models may split light beams.

At Berkeley lab, tiny needles, a fraction of a hair's width, position a micromotor for electric power test.



Utah's Stephen Jacobsen holds wafer of microsensors for robot; 1 sensor replaces 200 wires in its hand.

that machines would become smaller than the diameter of a human hair." Tang and his colleagues see their microdevices not only as clever machinery but also as things of beauty in themselves—the Golden Gate Bridge under 1,500-power magnification.

Most micromachines remain laboratory curiosities for now, but one subcategory is already a multimillion-dollar industry. It is silicon microsensors, tiny pressure sensors and strain gauges and thermostats that are embedded in much larger machines. Microsensors have few moving parts; they simply collect information. In the past ten years they have become common in cars, where they help to save gas by keeping tabs on the engine's air-to-fuel ratio. The latest microsensors are much smaller than their conventionally made counterparts, however, and this is setting off a race to build all sorts of faster, smarter, more-precise host machines.

In his Fremont office a few dozen miles down San Francisco Bay, Kurt Petersen, cofounder, vice president and technical chief of NovaSensor, rummages around in a tray he calls his toy box and extracts a loose coil of clear plastic wire the thickness of lightweight fishing line. "There's a little silicon pressure chip at the end of this tube here," he says. I can't see it, but I take his word for it. The chip, which NovaSensor makes for Millar Instruments of Houston, measures blood pressure. The plastic wire it's attached to is a heart catheter.

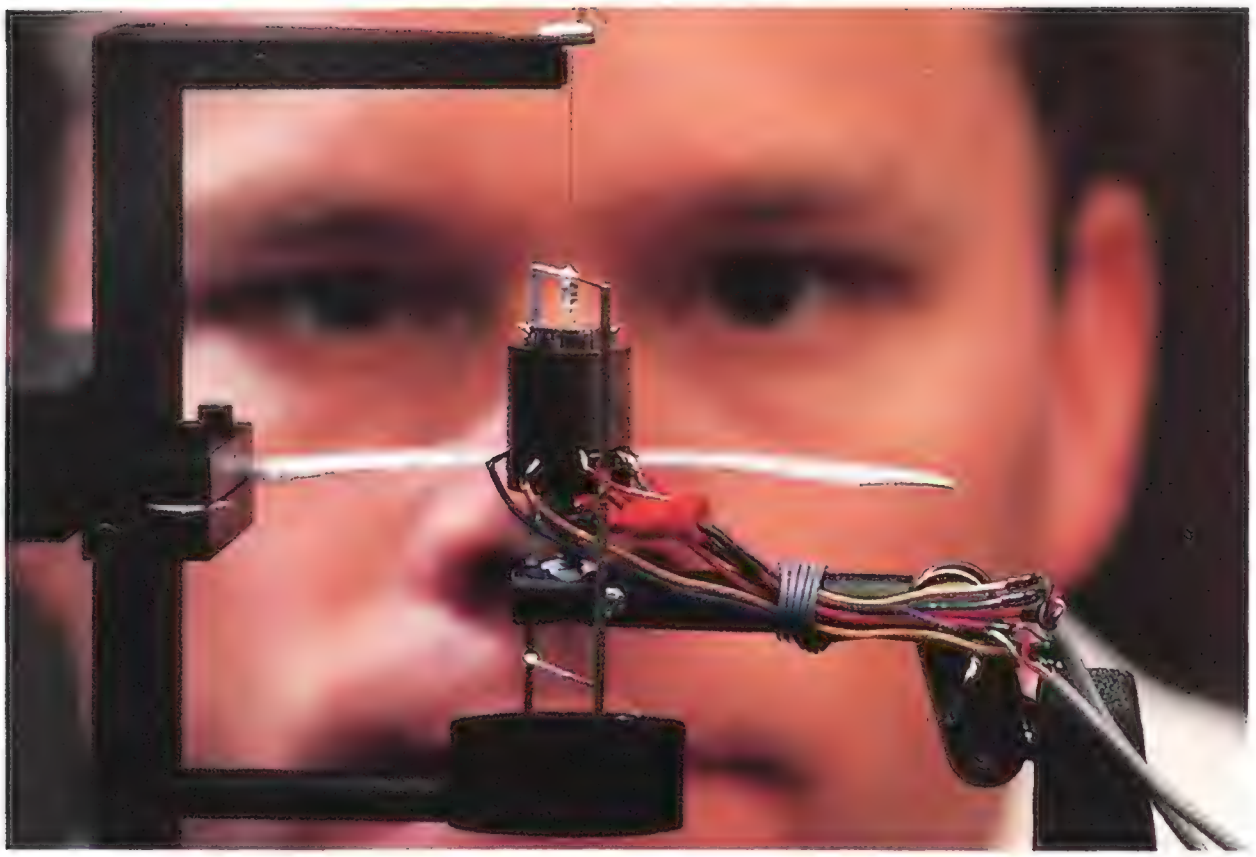
"The catheter goes in a vein in your arm," Petersen says, "and the doctor feeds it up into your heart, where the chip measures the pressure on either side of a heart valve." Blood flowing past its outer surface presses

THE ART OF ANTICIPATION.

COGNAC. L'ART DE MARTELL.

SINCE 1715.

For information on "Cognac. L'Art De Martell," call 1-800-228-4187. Void where prohibited.



University of Utah graduate student Dale Emery tests the torque of a tiny motor (too small to see) with a dynamometer. The motor twists the wire at top, and its strength is recorded on a calibrated bar (background).

against a microscopic diaphragm, which bends minutely as the blood pressure fluctuates. The sensor keeps track of precisely how much bending occurs, and a cardiologist can read out the blood pressure on an attached instrument. "This can fit through a perforation in a postage stamp," Petersen says. Since the catheter is so small, he explains, it's less hazardous than a fatter version would be when snaked through a patient's circulatory system. Moreover, since the sensor, like Berkeley's resonators, is manufactured in one piece, without welding and gluing and miscellaneous handwork, it's more accurate than a bigger, conventional sensor would be.

Petersen pulls other products from his toy box, all of them puny: sensors for wristwatch-altimeters, for tire pressure gauges, for scuba tanks. Microdevices are easy to handle when they're still part of an intact wafer, Petersen notes; it's when they're loose that your troubles begin. "You find them on the soles of your feet," he says. Asked about miscellaneous mishaps, staff scientist Farzad Purahmadi says, "Sneezing isn't the problem—inhaling is the problem," though he adds that he's never knowingly inhaled any of the company's products. "If you lose one," he laughs, "there are always extras around." Indeed, NovaSensor's catheter-tip sensors come 17,000 to a wafer, so finding a spare tends not to be a problem.

Later, suited up in white booties and a hairnet, I step gingerly through the company's clean rooms behind engineer Joe Brown. Here is where the chips are manufactured. Using tweezers, Brown picks up a reject from a collection of loose accelerometers and drops it under a microscope. Accelerometers are sensors that are etched in such a way that little "diving boards" remain carved out of the top layer. The diving boards flex whenever the structure they're inside of—for example, a car's airbag system or a plane's landing gear—speeds up, slows down, changes direction or is otherwise banged around. The cantilever Brown is peering at is actually an unusually heavy one. "This enormous mass goes up and down," Brown says, referring to what probably weighs less than a bread crumb, "and that puts a strain on these two narrow beams holding it up." The strain, in turn, is easily measured. Because its weight is so great, the cantilever jiggles readily and is thus well-suited to detecting the gentlest of motions. A variation could register the flow of air through a duct, for instance, as part of a "smart" building's ventilation controls.

Under the microscope, we take turns poking the cantilever with the splintered edge of a Q-tip. The board flexes and glints in the light, but try as I may I'm unable to crack it off from its two supporting beams. Stronger than steel indeed. Brown is enjoying himself as he pokes at the chip. "Some other guys get their kicks making the world's fastest computer switches," he says. "To me, those guys are just electrical plumbers. I don't want to look at switches. I happen to enjoy seeing physical things *move*."

A motion-sensing chip like NovaSensor's accelerometer may soon turn up in a host of unexpected places: as part of an automobile's antiskid system (it would detect fishtailing), as a sort of klutz-correction system in cameras (it would detect the way the photographer's

WE CAN LIVE WITH THIS KIND OF CRITICISM.

Fielding awarded the Seaward four stars. *Berlitz*, even more lavish in its praise, ranked the Seaward head and shoulders over other ships in the Western Caribbean.

But the newest ship in NCL's fleet has a lot more going for it than the experts' opinions. Like the Palm Tree, the Caribbean's first and only gourmet à la carte restaurant. One of the largest pools afloat. A state-of-the-art health spa. As well as entertainment and activities that are the envy of the industry.

Not to mention the entertainment and activities offered by the Western Caribbean itself. From Pleasure Island, NCL's exclusive private island, to Mexico and from the Caymans to Ocho Rios, no cruise offers sports, cultural and shopping experiences in such varied abundance.

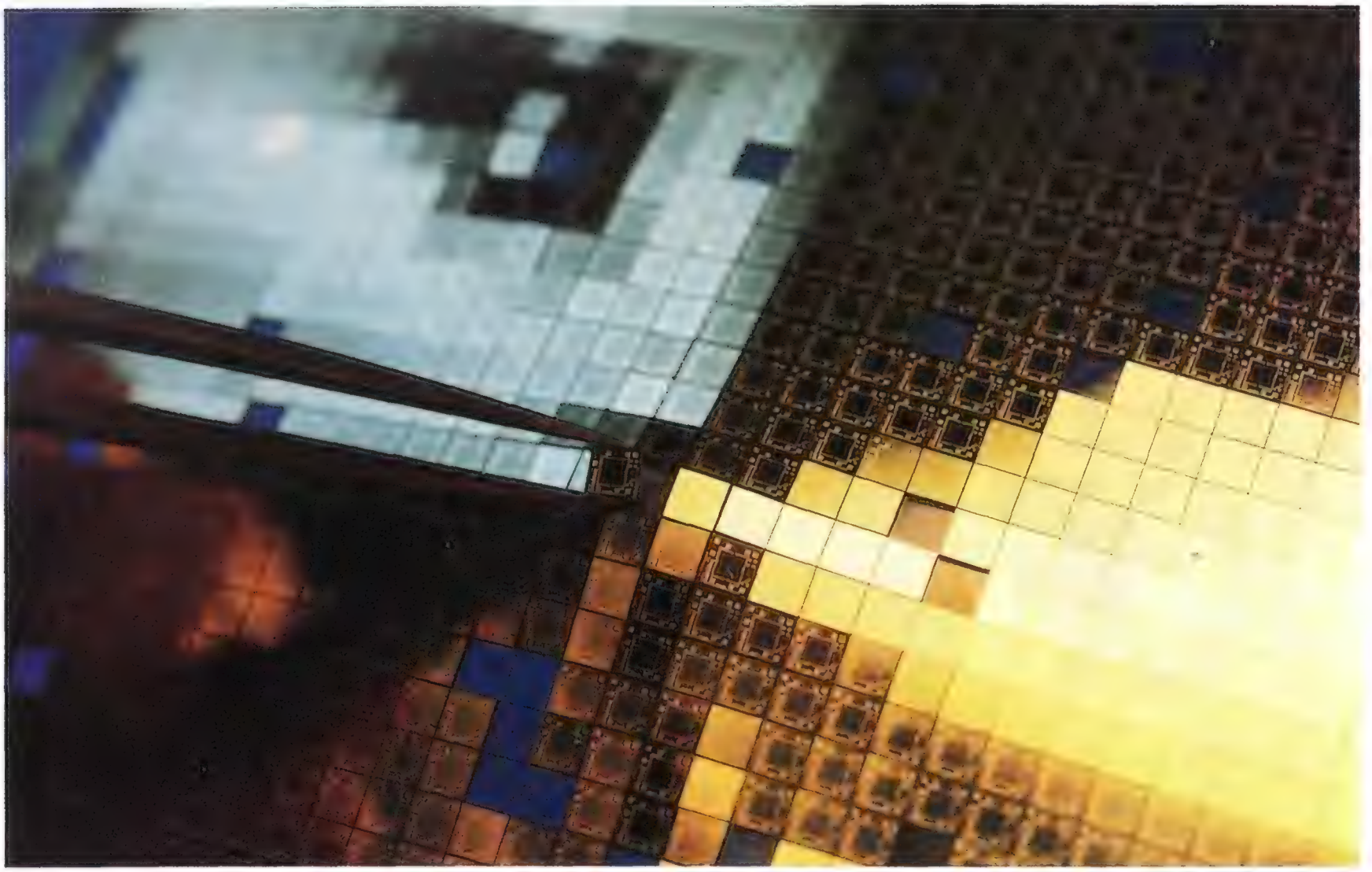
To get in on all the action, call your travel agent or dial 1-800-262-4NCL.

We have absolutely no doubt that you'll find the kind of criticism the Seaward gets very, very easy to take.

NORWEGIAN CRUISE LINE

The Pleasure Ships

SHIPS' REGISTRY: BAHAMAS ©1990 NORWEGIAN CRUISE LINE



At NovaSensor's labs in California, tweezers pick out one tiny sensor from a bed of thousands of identical devices. This is one of a new breed of biomedical sensors, a disposable monitor to check blood pressure.

hands are jiggling and compensate accordingly), in the floors of jewelry stores (for protection against burglars), perhaps even in tennis racquets (to compare your stroke with a preprogrammed ideal). IBM already sells a ball-point pen with three motion sensors, which banks and supermarkets use to detect forged signatures; the way people wiggle their hands when signing their names, it turns out, is as distinctive as a fingerprint. "There are so many possibilities for what you can build with microsensors that there isn't time to work on all of them," says Kurt Petersen.

If microsensors have plenty of clearly defined jobs awaiting them, the possible uses of microactuators—machines that move very small things a very short distance—are harder to pin down. A tiny pressure sensor can do anything a big pressure sensor can do, but a tiny lever can lift only tiny loads. Still, there are specialized tasks where smallness is the perfect solution. Ophthalmologists in Scotland are studying the possibility of someday grinding away cataracts by using micromachined power saws that would fit between the cornea and the lens, a few millimeters away. Texas Instruments has managed to squeeze 2,400 individually bendable mirrors onto the surface of a single silicon chip; high-speed printers use the chip to create letters and pictures. A future version of the chip, with a million mirrors, will serve as a switchboard inside an optical computer. Prof. Kent Udell of Berkeley has looked into micromachining as a way to cool off high-powered computer chips. "You could build little flippers on top of the chip, which would open up and release a bubble," he says. Synthetic sweat, in effect.

Steve Jacobsen, director of the University of Utah's Center for Engineering Design, knows exactly what he wants to do with microactuators: put them in robots. The Utah center is famous for its anthropomorphic devices, from artificial arms for amputees to animated robots used at Disney theme parks, but today's robots have a long way to go, Jacobsen is quick to acknowledge. "Motors and sensors are as large a bottleneck as artificial intelligence," he says. "Even if all the AI guys solved all the problems of computers, the result would just sit on a desk. It wouldn't move." A robotic arm now needs a whole array of pistons, tendons and electrical cables to swing 180 degrees. Jacobsen sees compact micromachined parts as the key to giving dextrous machines the grace and beauty of animals without the weight of a construction crane.

Jacobsen is excitable to the point of agitation when he talks about the virtues of the tiny motors his lab has fashioned. "An electric motor, no matter how clever you are, depends on a magnetic field that's produced by wires. You can only pack wires so tight, and the current they can carry is only so big." Muscles,

"Vision is the art of seeing things invisible."

Jonathan Swift

The future is composed of insights reflected by what we learn today.

At Toshiba, we've been turning those insights into a tangible future for over one hundred years.

Sustaining it now with our commitment to manufacturing in the U.S. And with a wide diversity of products of the highest quality.

All of which have helped make us one of the leading electrical and electronic manufacturers in the world.

With a unique perspective that helps us imagine a better tomorrow.

Joseph Jachna, *Door County*

Color TVs & VCRs • Computers & Printers • Copiers • CT Scanners • Digital Instrumentation • Disk Drives • Facsimile Systems • Home Appliances • Industrial Motors & Controls Liquid Crystal Displays • Medical Tubes • MR Imaging • Nuclear Medicine • OPTO Electronic Devices • Picture Tubes • Portable Audio • Professional Video Systems • Room Air Conditioners Semiconductors • Telecommunication Systems • Turbines & Generators • Ultrasound • Uninterruptible Power Supply • Variable Speed Drives • X-Ray Systems

In Touch with Tomorrow

TOSHIBA

Microactuator (in superimposed hand) is one of many that release car's air bag, as demonstrated by model.

however—those "ferocious actuators," as he calls them, that robot makers try to emulate in nuts and bolts—use electrical fields, not magnetic fields, to move. Micromotors do the same. Static electricity provides the power, dragging their rotors in a frenzied pirouette.

Understandably, if an electric motor relies for power on the same force that draws pet hairs to your lapel, it can't be expected to pack much punch. And the less a motor weighs, the less work it can do. A silicon micromotor whose rotor is spinning at 600,000 rpm would take roughly 15 minutes to spin a paper clip once. This is one reason the Utah center doesn't use silicon rotors for its motors. It uses steel and aluminum. A motor's rotor wobbles as it spins inside a hollow tube instead of being fixed to a bearing, so there is virtually no friction and very little wear—the micromotor's nemesis. (Abrasion had brought Berkeley's Fan-Tai motor to a stop in a few minutes.)

In the Utah center's micromachine lab, a map of the world is tacked to the wall above the lab bench where one of its "wobble motors" buzzes merrily away beneath a microscope. The Utah researchers used the map to trace the hypothetical travels of one of their earlier motors, as if its tiny shaft had been rolling along a road instead of wobbling in place. "We started out in Salt Lake City on the third day of February," says one of the engineers, tracing the route. "We went all the way to Washington, D.C., then back over here to see our friends in Berkeley, then across the ocean to Japan." After nearly nine months and more than 300 million revolutions, the motor finally broke down in Asia. "I think a grain of sand got into it in the Gobi Desert," says another engineer.

Because a wobble motor's metal tube and rotor can be as deep as needed, typically several millimeters, it weighs far more than a flat silicon rotor-on-chip and thus can interact with the outside world more easily without either stopping or disintegrating. The staff once glued a 25-micron drill bit to the end of a shaft and drilled into a chocolate chip, spewing out a spray of 1-micron chocolate chips—"work" to a physicist, if not in the usual sense of the word. The big drawback of the Utah motors is that they must be painstakingly manufactured, one at a time, using conventional machine tools.

Eventually, when refinements are made—and if ways to mass-produce them are devised—Steve Jacobsen foresees Utah's micromotors turning up in all sorts of places, not just in the elbows and pinkies of robots. "For the first time, we can think about putting machines at the ends of catheters that could, say, cut plaque out of your arteries." And, of course, there's always warfare. "People are talking about building airplanes with flexible wings," he says; "they wouldn't have flaps; they'd just bend." A wing like that would need large numbers of cheap, reliable sensors and probably a fair number of actuators, he adds. "Now, some people will say, 'You're just some professor talking. We don't need that!' But I'll tell you why we do. One day an airplane from another country will come screaming over your head and do a little whirly into the sky." He makes a corkscrew motion. "You'll say, 'What the hell was that?' and somebody else will say, 'That's the plane that just shot down all of your planes.' "

Machines that are waiting to find work

The micromachine people at the Massachusetts Institute of Technology are less exuberant in describing likely applications of their work, but they see it as a breakthrough technology all the same. "To some extent we have an answer, and we're looking for a problem," says Prof. Jeffrey Lang, simply. Thanks to mass production, they have fabricated tens of thousands of silicon motors (p. 96), along with other microdevices. Spare motors are stuffed in the backs of desk drawers and lie on tabletops. Cuff link-size chips with arrays of 100 working electrostatic motors are given to classroom visitors as keepsakes.

Prof. Stephen Senturia believes his micromachine group, part of MIT's microsystems lab, has largely solved the problem of friction and wear that doomed the first generation of silicon motors to one-minute wonders. In their latest chip-based motors, a donut-shaped rotor swings loosely around its bearing; inverse silicon wobble motors, they're called, though micro-Hula-Hoops would be a more succinct description. The next step, Senturia says, is to figure out how to get a rotor on a chip to do something useful besides spin. "Putting the equivalent of a drive shaft on that tiny

Truffles in Paradise.

Those who seek refuge from this far-too-civilized world will find paradise in Godiva® Truffles. For sheltered beneath the most imaginative coatings lies an Eden of incomparable delights. With such flavors as mandarin orange, raspberry, hazelnut praliné, chocolat au lait and chocolat noir, Godiva Truffles are truly heaven on earth. What better way to bid one's troubles adieu!

GODIVA
Chocolatier
BRUXELLES • NEW YORK • PARIS

Godiva Chocolatier, 701 Fifth Avenue, New York, New York 10022.
For more information about Godiva ® Chocolates, call 1-800-732-7333

© 1988 Godiva Chocolatier, Inc.

rotor so that when the rotor turns, the shaft also turns—that's a problem," he admits. But a temporary one, he feels sure.

In his sunny, paper-strewn office overlooking the campus, Senturia points to a framed photograph of one of the lab's earlier micromotors. In the center is a gearlike rotor with 12 square teeth around its outer edge. Imagine, he suggests, feeding living cells from a biological assembly line into the gaps between the teeth, one cell at a time. "I'd have a lazy Susan that could carry cells around." With a second lazy Susan nearby, cells of different types could be paired off and fused in a predictable flow. Cell fusion is an important tool in biological research, and it is normally a far more hit-or-miss affair. "I could also imagine," he says, "a gadget with a microactuator that's totally enclosed in your body. Every now and then, this little poker would jab a tiny bag of drugs, and the bag would release a drop of insulin or some other substance." No more worries about forgetting your medicine; what's more, the dosage would be round-the-clock regular and closer to the organ that needs it.

Senturia is an intense, impatient man, and he's irritated by some of the wilder speculations about the coming age of micromachines. "There's a certain tendency for science fiction to come pouring out of the woodwork when this sort of technology shows up," he says. Some of his colleagues, he adds with a tight smile, can be fairly "rhapsodic" on the subject.

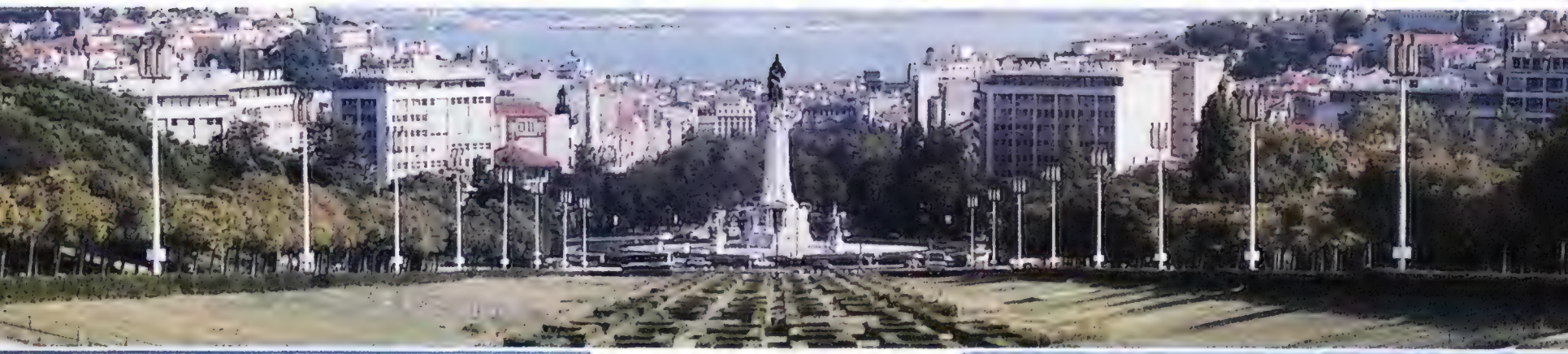
Among those who could qualify as rhapsodic are Anita Flynn, Rodney Brooks and Lee Tavrow of MIT's own artificial intelligence lab, just down the street. In a widely circulated 43-page memo-manifesto last year, the trio predicted the advent of "gnat robots," cheap, disposable, free-ranging robots powered by micromotors and capable of amazing feats when acting in concert. To wit: multicolored gnat robots clinging to the sides of houses and rolling over periodically when the homeowners wanted a new color. Or gnat-robot gardeners climbing three centimeters up each blade of grass and starting to saw—for that meticulous putting-green look. As the authors correctly concluded, "The Joneses would be so jealous." The microengineers, knowing how hard it has been just to get a rotor to spin freely for a minute, may groan at such near-delirious fancies, but most of them probably overlooked the memo's epigraph: "Imagination is more important than knowledge.—Einstein."

Prof. Jeffrey Lang at MIT holds a wafer of cheap, tiny motors that may spark new industrial revolution.

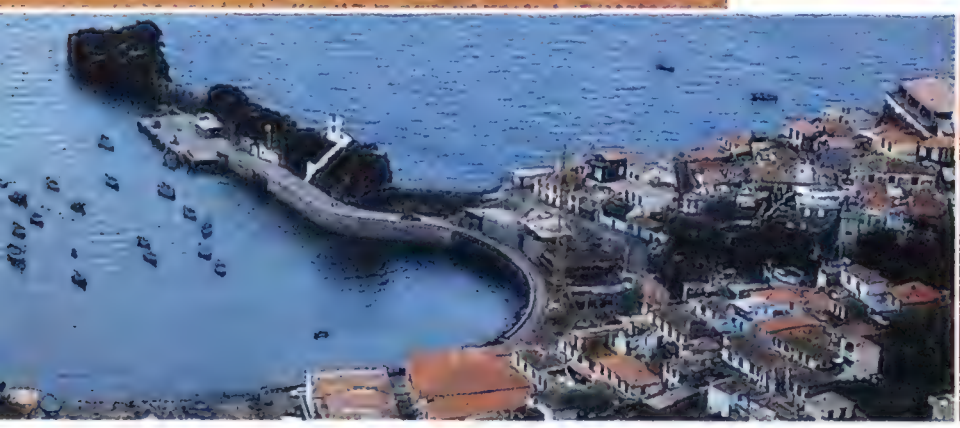
But their impact is still unpredictable. "We have an answer," he says, "and we're looking for a problem."

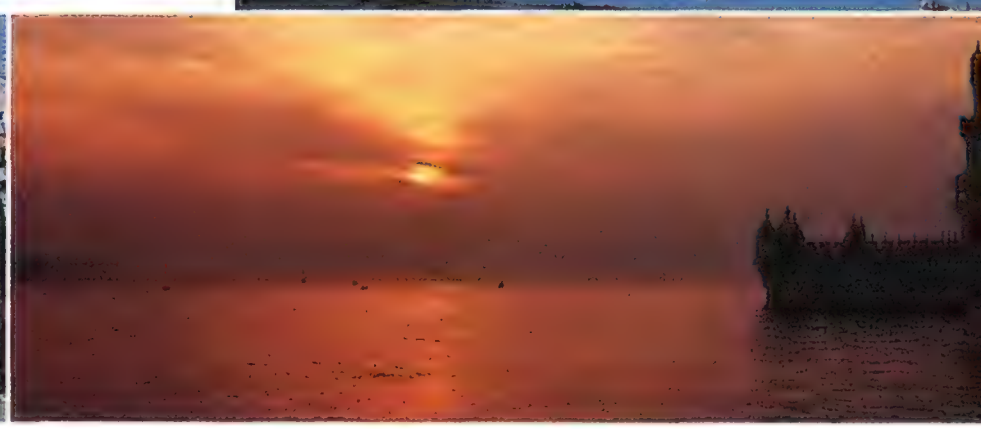
THE

LAND



OF





DISCOVERIES

In our country, you are the explorer because every visit is filled with discoveries. Our cities. Our countrysides. Our stately mansions. Our romantic country inns. Our excellent cuisine. Our golden beaches. And most of all, our friendly people. On your next trip to Europe, find out for yourself why the world knows that Portugal is truly the land of discoveries.

Portugal

Where Europe meets the Atlantic

AIR PORTUGAL

For an information kit write: Portuguese National Tourist Office, P.O. Box 9016, Dept. DMSMK, East Setauket, N.Y. 11733-9016.

By Joseph S. Levine

Coral reef fishes use riotous colors to communicate

Most creatures are prudently drab, but escape on a coral reef is so easy that many fish can use Times Square colors for self-advertisement

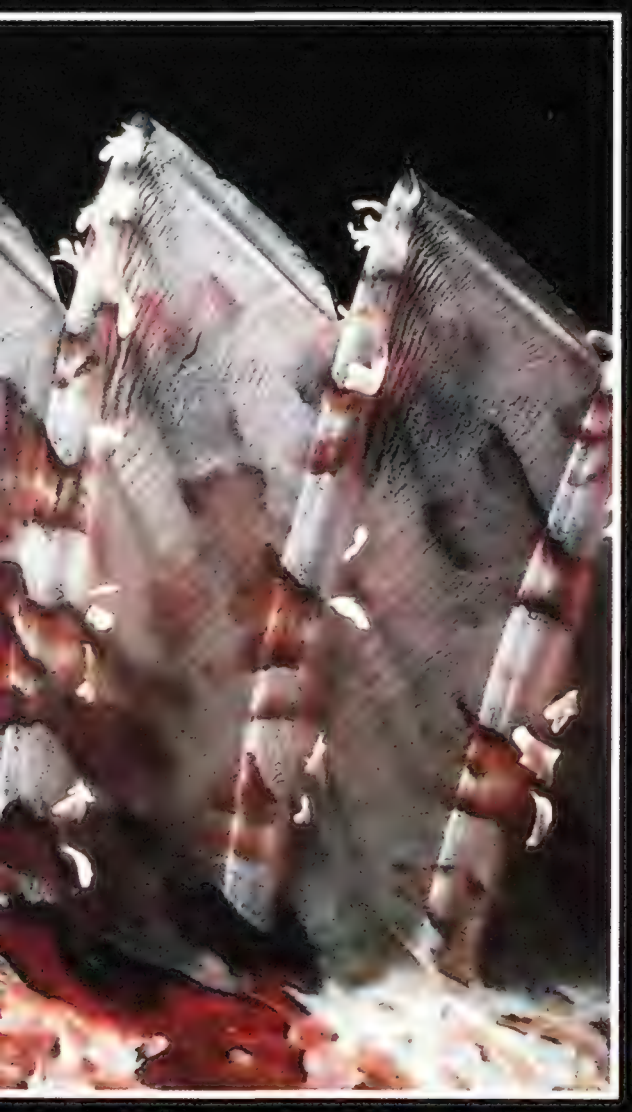
Coral reef fishes play games with our eyes, attracting attention here and diverting it there. As they lurk in the shadows or wheel amid the towers of the reef, their skins perform tricks with color, texture, contrast and form as adroitly as any human artist. Bold stripes of contrasting colors and chevrons of black on white appear everywhere, drawing and holding the eye like magnets. Jeweled spots ringed with halos of contrasting brightness or hue seem to vibrate against their backgrounds. Fins are outlined not just in white or black, but in combinations of bright yellows, blues, purples and other bold colors, as if to emphasize the line where fish ends and water begins.

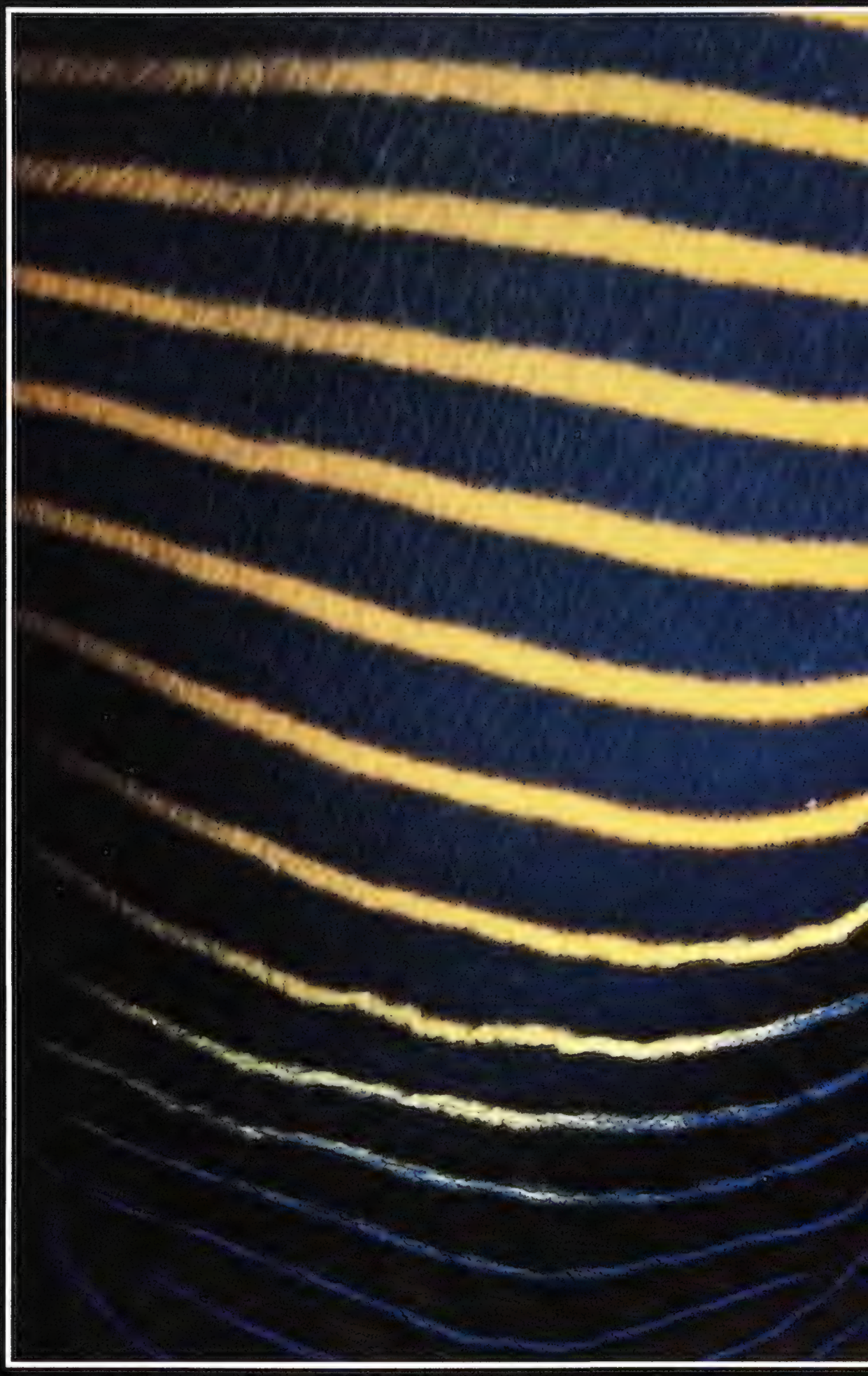
For biologists, wonder at the spectacle is accompanied by curiosity. These designs don't exist to amuse humans; they evolved because they serve a purpose in the lives of fishes (SMITHSONIAN, March 1983). Konrad Lorenz, who studied animal behavior, described these patterns as "poster colors," for he believed that they broadcast information as advertising billboards do. When we dive on reefs we are, in effect, surrounded by "conversations" held in "words" of color, form and behavior. To fishes, these tête-à-têtes are part of daily life; to humans, they are as exotic and initially as incomprehensible as Mayan glyphs.

What are these "conversations in color"? They are as various as the reef is complex. Most convey information, but some demonstrate the dark arts of disinformation. Species such as scorpionfish, for example, cast spells of invisibility that help them ambush their next

Scales, fin of a sex-changing parrotfish

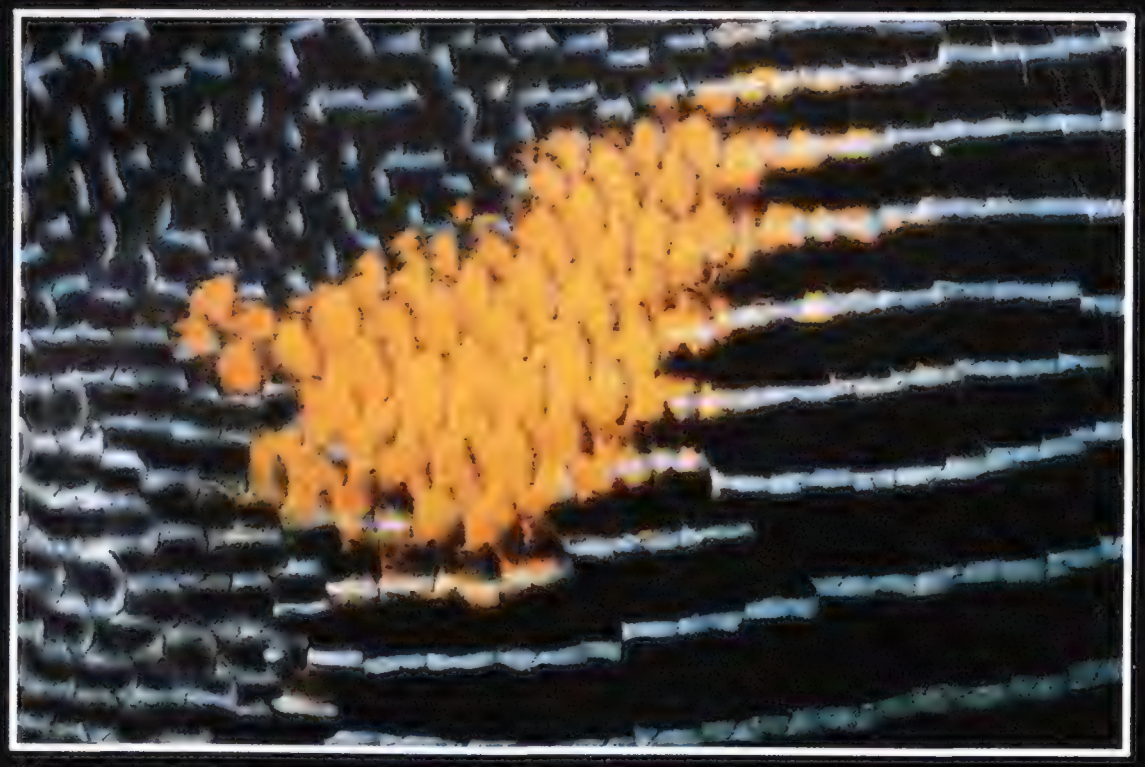
Camouflaged spines of a scorpionfish





Emperor angelfish, easy to spot in a crowd

Photographs by Jeffrey L. Rotman

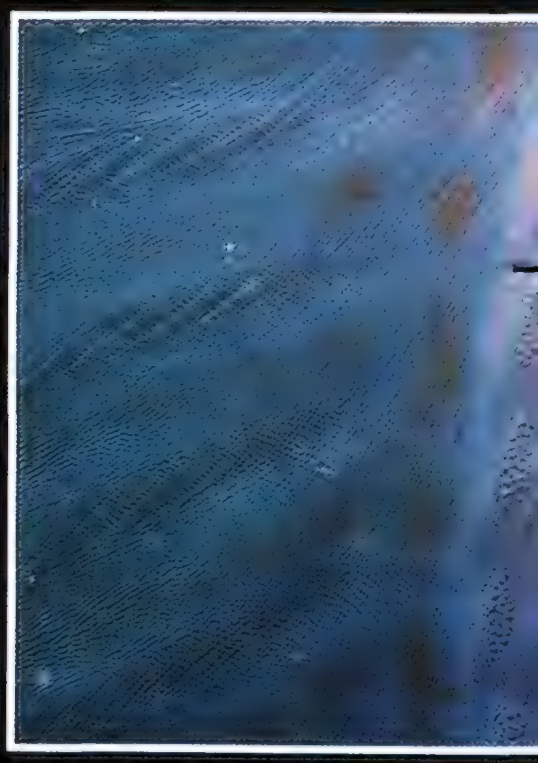


Orange splash warms surgeonfish's side

Blue polka dots adorn this stingray

A color-changing grouper

Red fin completes squirrelfish decor



Moonscape? No, triggerfish skin

There are 13 orange bars on a butterflyfish

Edging is all, on royal angelfish bars

Turkeyfish spines begin in fanlike rays

meal. These hunters-by-stealth adopt colors and textures that blend in with the carpets of algae and corals on which they rest.

Colors and patterns that catch the eye, on the other hand, convey specific messages. Some seem to improve the ability of fishes to stake out and defend space for feeding and breeding. Among certain fishes, color changes signal success or defeat in battle, or announce sovereignty over a patch of turf. With groupers, color changes register alarm or signal submission after a fight. In all these cases, the urgency of the message requires visibility in the visually complex coral realm.

Still, one nagging question remains. Elsewhere in the sea (and on land, too, for that matter) the threat of predation seems to have forced most animals—including the females and young of some of the fish species on the reef—into inconspicuousness rather than into advertising their whereabouts. There are, after all, neither fluorescent-yellow herring nor scarlet-and-chartreuse antelope. So how can so many reef fishes brazenly use colors for everyone—friend and foe—to see?

When escape is easy, it's OK to be seen

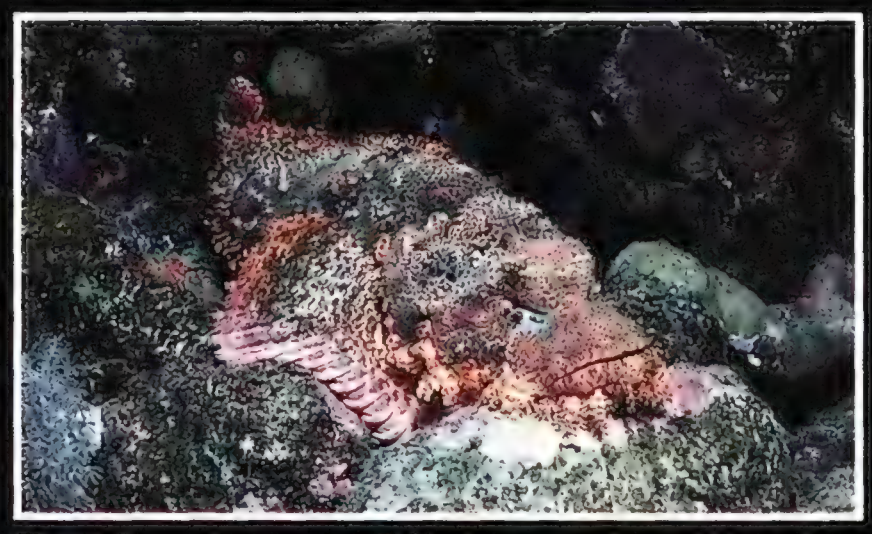
The answer preferred by many researchers relates to the reef itself—a complex honeycomb of coral skeletons that affords innumerable hiding places for fishes near it. A reef fish that spies a predator, unlike a fish in open water, has a good chance of finding shelter with a few strokes of its tail. Furthermore, most fish-eating reef predators hunt at dawn and dusk, when colors are less visible. It may thus be that the colors of reef fishes are less important than speed and agility in keeping them from the jaws of death. And for the purpose of sending and receiving messages, bright colors win out.

We as human observers see this living color spectrum with our own visual systems. But might the fishes themselves see a different rainbow or none at all? We have as yet no test to resolve whether animals see things precisely as we do. We do know, however, from research on fish eyes and brains, that many fishes see a world filled with colors. Some see more colors than we can, and others see well in parts of the spectrum where human eyes perform dismally.

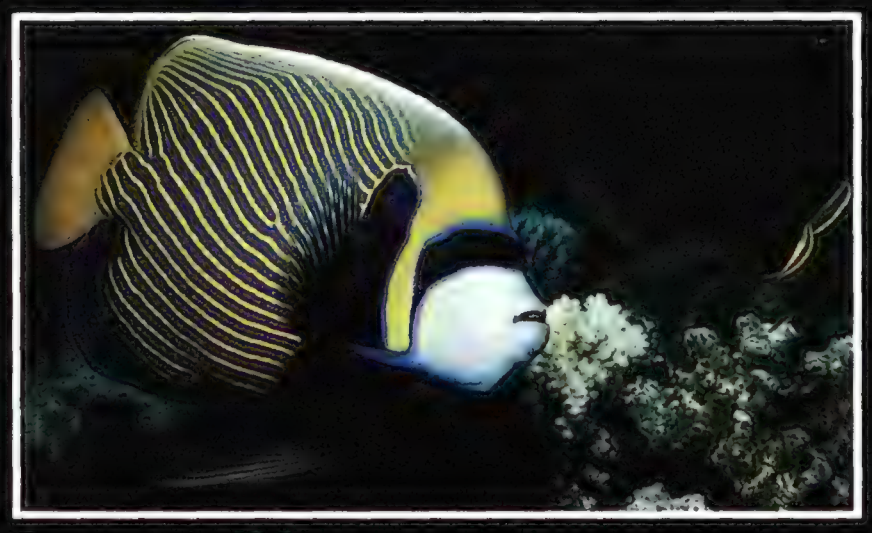
Despite these exceptions, there seems to be extensive overlap between the visual worlds of at least some reef animals and that of our own species. How can we make that judgment? Because the camouflage that evolved to fool fishes succeeds in fooling our eyes as well, we know that the fishes' visual world bears at least some resemblance to our own. Connoisseurs of animal coloration should be grateful for that incidental perceptual overlap. For if these animals viewed the world through radically different eyes, the colorful language of fish skins might be invisible to mankind.

Fish from which details were taken are shown here in order of appearance

Rusty parrotfish



Sharp-headed scorpionfish

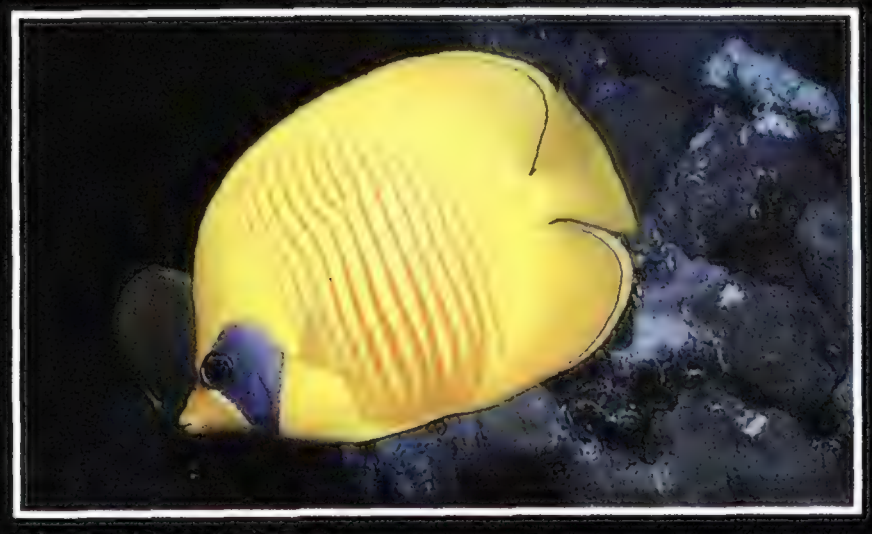


Emperor angelfish

Sohal surgeonfish

Blue triggerfish

Blue-spotted stingray



Masked butterflyfish

Saber squirrelfish

Royal angelfish

Lunartail grouper

Clearfin turkeyfish

CAMRY V6

POWER FOR THOSE WHO ARE SO INCLINED.

To those unfamiliar with the Toyota Camry V6, driving it can come as a surprise. Not because it has such generous room. Not because Camry has been the most trouble-free compact car in America for three years in a row.* What people find surprising is that a car so good at so many other things is also such a powerful performer.

The Camry V6 is equipped with a Four-Cam, 24-valve, electronically fuel-injected engine that generates 156 horsepower for spirited response on winding roads or city streets.

More importantly, that same V6 engine produces 160 foot-pounds of torque. Which means that even with all five seats filled, there is plenty of power to spare—even on steep grades.

So whatever your power needs, reassurance is only as far away as the accelerator. Demonstrating yet again that, with the Camry V6, you have just about the perfect car. No matter what your inclination.

"I love what you do for me."

TOYOTA

Call 1-800-GO-TOYOTA for a brochure and location of your nearest dealer. *J.D. Power and Associates 1988, 1989, 1990 Initial Quality Surveys.* Based on owner-reported problems during the first 90 days of ownership. Get More From Life... Buckle Up! ©1990 Toyota Motor Sales, U.S.A., Inc.

No image of H. W. Fowler would be complete without his tireless collaborator, brother F. G., in background.

By Israel Shenker

For the King's English, fighting the good fight

From his cottage on Guernsey, H. W. Fowler produced tomes on usage that won the hearts of lowly scribblers and lofty grammarians alike

For the best part of a century, H. W. Fowler has been supreme lawgiver for English usage, guiding neophyte and faithful to a writer's paradise in which errors dissolve and every sentence scans. Surviving the strictures of critics, the indifference of nonbelievers and the hosannas of the observant, his tablets of the law—*The King's English* (1906) and *Modern English Usage* (1926)—have stood fire against linguistic neglect and abuse.

For his services to letters, Henry Watson Fowler has been called "blessed" and "immortal," but he was a most unlikely authority figure—modest, shy, even reclusive, living the life of a hermit—and, like the least of men, shared the burden of mortality (1858-1933).

First and foremost, a love of letters

Born in England, the first of seven sons and a daughter, Fowler went to Rugby and to Oxford's Balliol College. For 17 years he taught at Sedbergh, a Yorkshire secondary school for boys, trying to communicate his love of letters. Offered promotion to housemaster, he declined. A housemaster was expected to prepare students for confirmation in the Church of England; Fowler felt that he could not in good conscience do this. He resigned and moved to lodgings in London.

Believing that one should be able to live on a hundred pounds a year, he set about proving it. Fowler had a yearly £120 left by his father, and he embraced the insecurities of freelance journalism, earning another £30 a year. Part of his income he donated to his landlady, whose policeman husband was in ill health.

A man of methodical habits, Fowler would jog every morning to Hyde Park's Serpentine lake for a swim. Once, he returned with cuts on his chest from the ice he scraped as he swam; another time he got lost in the fog and had to be rescued, exhausted, by a boatman. Breakfast after the swim was a boiled egg and toast; every morning he turned the week's remaining eggs so the yolks would not gravitate to the shell and court decay. He confessed that he had a "pedantically tidy soul."

In 1903, Fowler joined his brother, Francis George, on the island of Guernsey. Frank had built a small, three-room granite cottage. Fifty yards away, looking down from the meadow to the sea a mile off, Fowler built a one-room matching cottage.

Early each morning, Fowler would jog to the sea, swim, jog back. After breakfast, he worked until lunch, often outdoors in striped rugby jersey and knee-length shorts. He and Frank took turns preparing lunch—relying on twice-weekly visits from the butcher. "On most days a dozen words is as much as I have occasion to say to anyone but myself," Fowler noted. "It is extremely seldom that I have to take out my manners and put them on." Sundays he walked six miles to town for Sunday mail delivery.

From acronym to zinger, the brothers Fowler made
the English language fall into line, yet kept it lively.

It was a long way to go for rejection slips. He had collected his essays—which no publisher wanted—into two typewritten volumes. However earnest his aims and punctilious his language, Fowler had not found his genius in schoolteaching, and he did not find it in his essays. During his London stint, Fowler had one book of essays printed at his own expense, and in emulation of Charles Lamb called it *More Popular Fallacies*, concealing his own identity behind a pseudonym.

Again at his own expense, Fowler published *Si Mihi* (If I Had), reissued in 1929 as *If Wishes were Horses.* Characteristic chapter headings: "If I had imagination" and "If I had opinions." The author described himself as "horribly self-conscious & introspective . . . a colourless neutral sort of person," lacking the energy to make him a man of opinions.

From their Guernsey cottages the brothers collaborated on a mildly expurgated translation of works by the Greek author Lucian, the translators identified as H. W. and F. G. Fowler. Each section bore the initials of its translator, and one reviewer suggested that the "lady" was on occasion more brilliant than her "husband."

Soon after *Lucian* appeared, H. W. Fowler wrote their publisher, the Oxford University Press (OUP), proposing "a sort of English composition manual, from the negative point of view, for journalists & amateur writers. There is a vast number of writers nowadays who have something to say & know how to make it lively or picturesque, but being uneducated cannot write a page without a blunder or cacophony or piece of verbiage or false pathos or clumsiness or avoidable dullness." The reply came: "We in the office would welcome an antibarbarus."

The results of their efforts, *The King's English*, freely cited eminent authors' stumblings, exposing the fallibility of practitioners such as Dickens, Emerson, Kipling, George Eliot and *The Times.* The book offered only five basic commandments:

> Prefer the familiar word to the far-fetched.
> Prefer the concrete to the abstract.
> Prefer the single word to the circumlocution.
> Prefer the short word to the long.
> Prefer the Saxon word to the Romance.

Merciful lawgivers, the Fowlers allowed for occasions when the flesh was weak and the word distended, or when exactness demanded the intrusion of the Romance, or indeed whenever circumstances justified dissent from the letter of the law. When the head of the OUP read the appendix that the Fowlers proposed for the second edition—six months after the first—he wrote them: "I am I must confess distressed by discovering in it 'apologetic remarks'. . . . The book has a great chance of establishing itself, if the public can be persuaded that it is always right. Nothing should be allowed to undermine confidence and permit the public to think that it could continue to live at random (and what is worse, not buy the book)." "I am sorry we have forgotten the Dogma of Infallibility," Fowler replied, "but we are ready to return to the true faith."

In 1906 the OUP asked the penitent infallibles if they would do a concise dictionary—and how long it would take. Five years, the Fowlers said. Since Oxford's lords of language had sorrowful experience of lexicographers' delays, they were skeptical. But they had much to learn about the Fowlers. The first edition came out in 1911.

One peculiarity of the *Concise Oxford Dictionary* was the space devoted to common words—prepositions, conjunctions, pronouns and such pedestrian specimens as *go, hand, put* and *way.* The book offered enlightenment to its users and engendered perplexity in its makers. "We were plunging into the sea of lexicography without having been first taught to swim," Fowler grumbled.

Even so, life on Guernsey was not all scholarly strug-

Illustrations by John Huehnergarth

Fowler's stint as graybeard volunteer in World War I altered meaning of words like "trench" in later works.

gle. Fowler sometimes took time off to visit an old friend in a nursing home on the island. The superintendent, Jessie Marian Wills, age 46, white-haired since an illness at age 25, kindly lent her sitting room for the visits. On February 29 of that leap year, 1908, Fowler proposed the Great Adventure to Miss Wills, and ten days later, on March 10, his 50th birthday, they married. (They wed despite Fowler's earlier protestations, in his essays, that "I am one of the faint hearts that do not win fair ladies.")

When World War I broke out, Fowler patriotically urged young men to enlist, then wondered how he could justify doing that while remaining safe at home. So he signed up, age 57, giving his age as 44. Frank, 45, and by now also married, signed up with him in the Sportsmen's Battalion.

Fowler's letters to his wife from France offer a slightly expurgated version of the trials that followed:

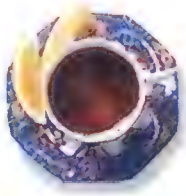
> January 6. The authorities here are not at all pleased with so many old men's being sent out to them; there was an inquisition into our ages this morning, and I begin to doubt again whether I shall ever be allowed to go into the firing trenches; but we shall see.
>
> January 9. The divisional medical officer . . . asked each of us his age, and . . . did indeed say 'Good heavens!' when I told him 57.
>
> January 20. Billeted in a farm; landlady calls H. W. *Papa*: Madame refuses to believe *Papa* is going 'dans les trenchées' [into the trenches].

Papa went into the reserve trenches, and came under fire, but then the oldsters were withdrawn. Requesting either soldier's work or freedom from service, the Fowlers—following orders—put their plea in writing, identifying themselves as "Pte H. W. Fowler (M.A. Oxon., late scholar of Balliol: age 58) and Pte F. G. Fowler (M.A. Cantab., late scholar of Peterhouse: age 46)." They signed themselves as authors of "*Translation of Lucian*, 4 vols.; *The King's English*; *The Concise Oxf. Dict.*" Their letter said they had enlisted to fight, misstating their ages as a patriotic act, not to do "menial or unmilitary duties such as dish-washing, coal-heaving, and porterage, for which they are unfitted by habits and age."

In May, Fowler was shipped to England and hospitalized with gout. He was discharged in June. His brother Frank died of tuberculosis in 1918.

The war left its mark on a new project that the brothers had been preparing, the *Pocket Oxford Dictionary*. In the *Concise Dictionary*, "trench" had been defined as a "ditch about 3 ft deep with earth thrown to form parapet." Now "trench" was a "deep ditch esp. one dug by troops to stand &c. in sheltered from enemy's fire." "Barbed wire" had been "for fences, with

AN EXOTIC BLEND WITH ORANGE PEEL, FRUITY HERBS, AND CLOVES



It was a **COLD** *night and I had a hot date with* Mr Bubble *and an even hotter cup of tea so I poured a big steaming cup,* **INHALING** *the rich rush of orange as I s a u n t e r e d to the tub to test it with my toe (Just Right) I s a n k in and sipped small orange spice sips as the* steam warmed *my face and swirled through the room until there was nothing else but me and a river of* Orange Blossoms *lightly lapping against a spicy slightly* CINNAMON *shore the lazy lull of its waves* **SUDDENLY** *broken by a big long* **slurrrrrrrp?!** *The plug had been pulled.* Mr Bubble *made a* **noisy** *exit d o w n th e dr a i n.*

A DIFFERENT CUP OF TEA

Fowler made allowances for bending of the rules: to willfully split an infinitive, he decreed, was permissible.

wire prickles at intervals." Now it was "used in fencing, & esp. as obstruction in war."

When the publisher wondered about Fowler's future employment, Fowler suggested "an idiom dictionary—that is, one that would give only such words as are in sufficiently general use to have acquired numerous senses or constructions & consequently to be liable to misuse." The OUP replied, "A Utopian dictionary would sell very well—in Utopia," but two years later welcomed the proposal.

Fowler suggested that his proposed book was for "the half-educated Englishman of literary proclivities who . . . has idioms floating in his head in a jumbled state, & knows it." When he submitted his draft preface, the head of the OUP called it "Terrible." Fowler, fallible, rewrote. He had few illusions, never thought himself omniscient. In one letter to the head of the OUP he confessed: "I have been caught accenting *crème* wrong for twelve years, in three books, & in six places. Would you put on record, for corrections to be made when possible, the three slips enclosed herewith." Lexicography, he lamented, "is full of humiliations."

Dedicating the new work, *A Dictionary of Modern English Usage*, to his brother Frank, Fowler wrote: "I think of it as it should have been, with its prolixities docked, its dullnesses enlivened, its fads eliminated, its truths multiplied. He had a nimbler wit, a better sense of proportion, and a more open mind, than his twelve-year-older partner. . . ."

Into the alphabetic structure of the work, Fowler introduced idiosyncratic entries that would hardly occur to those seeking enlightenment, such as "pedantic humour," "formal words," "hackneyed phrases," "sturdy indefensibles" (e.g., "our MUTUAL friend," "It is only a very APPROXIMATE estimate") and "Siamese twins" ("alas and alack," "lo and behold"). "Out of the frying pan" dealt with mistakes arising from the attempt to avoid mistakes, plunging the writer from the frying pan in which he would have embroiled himself only slightly, into the searing flame. Example: "*The reception was held at the bride's aunt.*" Understandably, the writer of that sentence wanted to avoid "bride's aunt's," but he could have stayed exemplary and cool by introducing "at the house of."

In "avoidance of the obvious," Fowler suggested, "The obvious is better than obvious avoidance of it." He noted: "Much misplaced ingenuity in finding forms of apology is shown by writers with a sense of their own superiority who wish to safeguard their dignity and yet be vivacious . . . to touch pitch and not be defiled. Among them are: *To use an expressive colloquialism—so to speak—in homely phrase—not to put too fine a point upon it—if the word be not too vulgar—as they say—to call a spade a spade—not to mince matters.* . . . Such writers should make up their minds whether their reputation or their style is such as to allow of their dismounting from the high horse now and again without compromising themselves." And he proclaimed it permissible to courageously split infinitives and use a preposition to end a sentence with.

When *Modern English Usage* came out in 1926, Fowler was gratified by its reception, noting: "They have almost all been as kind as possible, though I confess I should have liked to see the words 'terrifying' and 'sarcastic' and 'sardonic' rather less often." Fowler was not out to stifle creativity, but to stimulate clarity and discourage the pedantic and pompous. An eminent critic described him as an "instinctive grammatical moralizer," and Fowler conceded. "I am neither philosopher nor historian, only an adviser whose concern is with what should be," he suggested.

Those who consulted *Modern English Usage* came to swear by—occasionally at—the lawgiver. "Why must you write *intensive* here?" asked Winston Churchill, interrogating the director of military intelligence about plans for the Normandy Invasion. "*Intense* is the right word. You should read Fowler's *Modern English Usage* on the use of the two words." The late historian A.J.P. Taylor thought *MEU* perhaps the greatest work ever published by the Oxford University Press.

Israel Shenker, who writes from a cottage in Scotland, has contributed articles on matters British, from Stoke-on-Trent pottery to shopping at Marks & Spencer.

After 400 flashes in your camera, how much power is left in this battery?

The answer is at your fingertips.

The Copper Top™ Tester tells you instantly if a battery is good or if it needs to be replaced. So you need never get stuck with a camera that won't work.

If you're not sure how much power a battery has left – just pop it in the tester. It's part of the package. It's absolutely free. And it's only from Duracell.

© 1990 DURACELL Inc

From the beginning of their long careers with Oxford University Press, the Fowler brothers found the OUP promoting an image of infallibility. When *The King's English* appeared, the publisher opined "The book has a great chance . . . if the public can be persuaded that it is always right."

Essayist Joseph Epstein called Fowler's guide "one of a shelf of fifty or so great books written in English, in this century." Robert W. Burchfield, the celebrated lexicographer who edited *A Supplement to the Oxford English Dictionary*, termed *MEU* "the Bible of prescriptivists." He is preparing a new work designed to succeed Fowler's, last revised by Sir Ernest Gowers in 1965.

Fowler himself never rested on his laurels or neglected life beyond work. He wrote poems to Jessie, slipping them under her pillow. Sample verses:

> My wife and I we disagree
> On every mortal matter;
> The Sprats, 'tis said, were odd; but we
> Are infinitely Spratter.
>
> Words are my study, life is hers;
> We go to different teachers;
> I learn from books, while she prefers
> To learn from living creatures.

Having come late to love, the couple made the most of newfound joy. They moved to a larger house beside a brook. She tended the garden, he cleared the brambles and rough patches of lexicography. Then the "Spratters" took the final leap to the mainland, settling in Hinton St. George, in Somerset. Eager to help Fowler, the OUP offered to pay for a servant. He responded: "My half-hour from 7:00 to 7:30 this morning was spent on (1) a two-mile run . . . (2) a swim in my next-door neighbour's pond—exactly as some 48 years ago I used to run around the Parks & cool myself in (is there such a place now?) Parson's Pleasure. That I am still in condition for such freaks I attribute to having had for nearly 30 years no servants to reduce me to a sedentary & all-literary existence. And now you seem to say: Let us give you a servant, & the means of slow suicide & quick lexicography. Not if I know it; I must go my slow way."

Doing it his way, he had finally found his true genius. This the head of the OUP recognized, writing to his deputy: "We must do anything, agree to anything, ignore anything, to keep him in his admirable rut." That brought a renewed offer of a couple of hundred pounds extra. Weary of resistance, Fowler replied: "All right; if you insist on making a millionaire of me, do so."

He wrote a colleague that he was being pressed to undertake the *Quarto Oxford Dictionary*, and "I shall have to make up my mind whether such an undertaking is for a unocular septuagenarian [he had lost the sight in one eye], or whether he would rather put himself on the shelf." Fowler wrote the publisher, "To

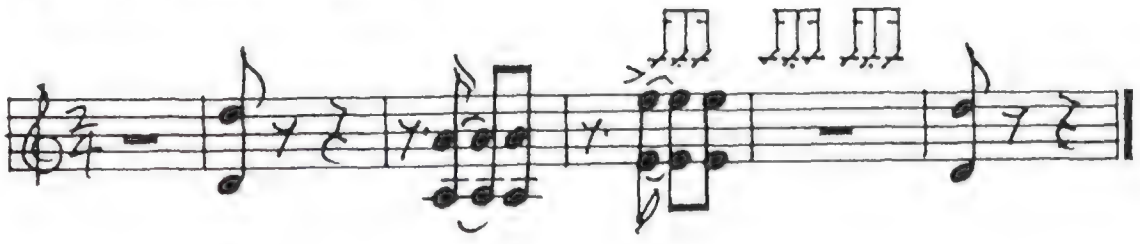
OFF-CAMERA VOICE: Would you say you know a lot about cars?

MAN: Yep.

OFF-CAMERA VOICE: Tell me, if you could trade your all-wheel drive Eagle Talon for any other car in the world, what would it be?

MAN: A mistake.

(MUSIC)



Advantage: Eagle

Chrysler's Newest Division

Eagle Talon TSi with all-wheel drive and 195 horsepower turbocharged, intercooled engine is backed by Chrysler's exclusive 7/70 Protection Plan. This plan protects the engine and powertrain for 7 years or 70,000 miles and against outerbody rust-through for 7 years or 100,000 miles. See limited warranty at dealer. Restrictions apply. For more information about Eagle Talon, or how to buy or lease one, call 1-800-JEEP-EAGLE. Buckle up for safety.

Fowler's love for letters was exceeded only by his devotion to his cherished wife, Jessie. A poem he wrote attests to the fulfillment the couple found in marriage late in life: "She says the world's to her one man, / To me it is one woman."

put a man of 72 to such a job is a flying in the face of the actuaries."

The OUP mobilized its resources of flattery, and Fowler caved in: "What can I say but that you have given me a grand send-off? And what can I do but get to sea without more ado?"

Suddenly the crew had a new first mate, yet another Fowler sibling, Arthur John, who came as a total surprise to the OUP. He was also an Oxford-educated classicist who taught at Sedbergh. Indeed, Fowler himself was remote and mysterious to the people in Oxford. Only two people at his publisher's had ever laid eyes on this hero of the pen, though just about anyone could enlist his services. "I am one of those fools who are too much flattered by questions from strangers to treat them summarily," Fowler wrote a friend, "and must always give them more answer than they are expecting."

The OUP worried that the *Quarto* would never sell in America "without a liberal sprinkling of Americanisms." "Do you feel that it would be a sin to admit them," the head of the company asked Fowler, "even with an asterisk or . . . some other sign of disapprobation?" One Oxford watchdog kept a scrapbook of Americanisms from which he dredged, for the Fowlers, what he termed "heaps of filth of various degrees of abomination." Fowler replied that he had "no horror of Americanisms" but that he was simply unfamiliar with them.

Time for such niceties and abominations was harder than ever to come by. His wife's health was deteriorating, and Fowler assumed more of the burden, rising at 4 or 5 each morning to sweep the downstairs rooms, clean the shoes and prepare for the day. At 7 he took Jessie a cup of tea and then breakfast in bed. After supper he would read to her.

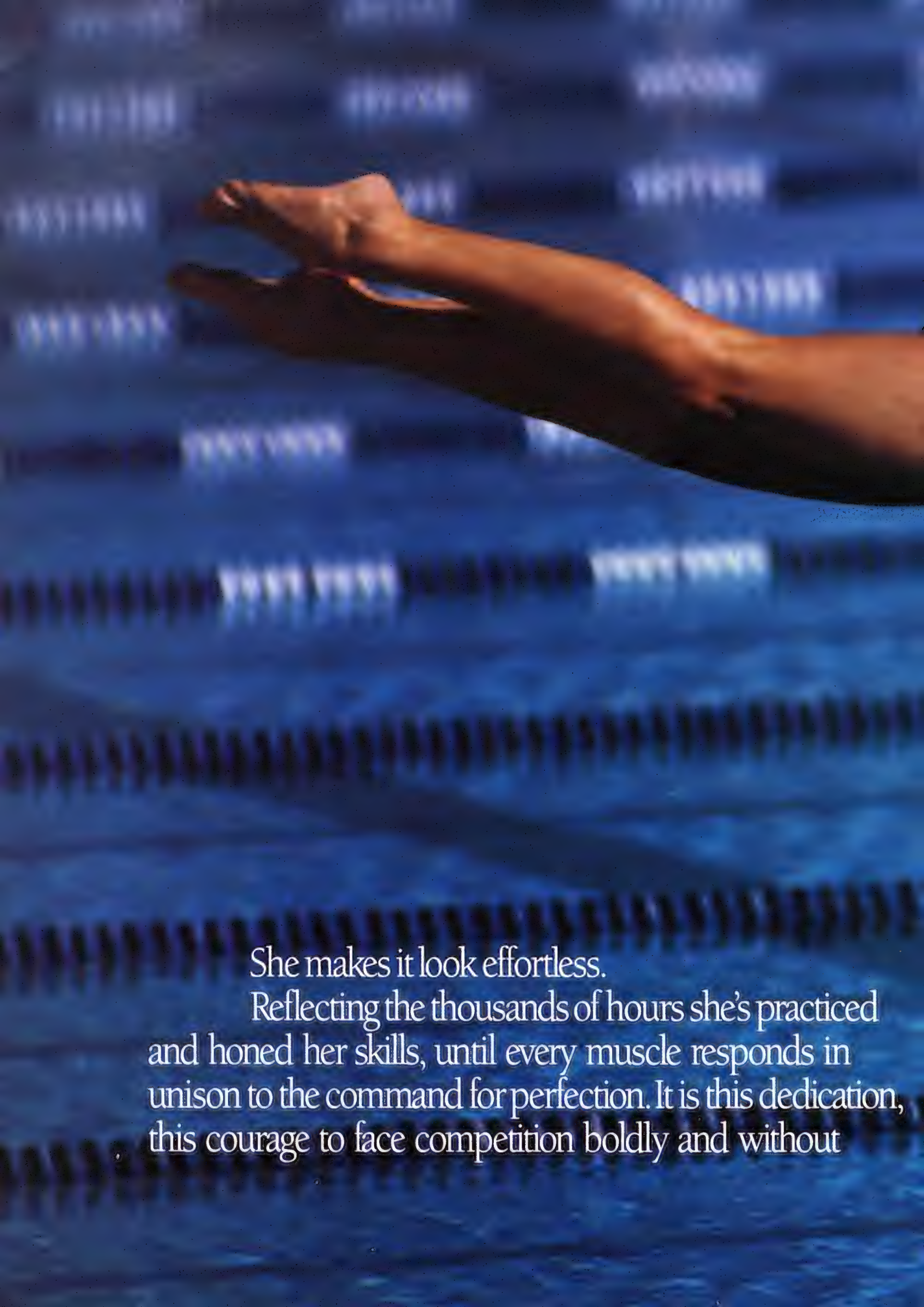
Jessie died in 1930. The next year Fowler published a volume of pillow poems, as a gesture toward encouraging others' mature love. He took his title from an old-fashioned couple celebrated in an 18th-century ballad and called his book *Rhymes of Darby to Joan* "being flotsam from the good ship Felicity launched 1908, foundered 1930."

In September 1932 he reported to the OUP that a doctor who had earlier pronounced him fit now found "dismal changes." "He cut off my running, cold bath, lawn-mowing, all weight-lifting or other exertion, & any food more meaty than chicken."

That Christmas he set a record: he neither spoke nor was spoken to. As the next Christmas approached he contracted pneumonia. Two days after Christmas, A. J. Fowler wired the Oxford University Press, "My brother died very quietly yesterday." It would, of course, have been out of character for H. W. Fowler to make a fuss.

Long considered the supreme lawgiver of English usage, Fowler would have been appalled by public adulation.

OUR HERO
Huehnergarth



She makes it look effortless.

Reflecting the thousands of hours she's practiced and honed her skills, until every muscle responds in unison to the command for perfection. It is this dedication, this courage to face competition boldly and without

compromise, that has inspired Phillips Petroleum to proudly sponsor United States Swimming since 1973.

And we'll be national sponsor for years to come.
Because we believe that with every leap of grace and form, we are watching the future of our nation take shape.

PHILLIPS PETROLEUM COMPANY PHILLIPS 66

For more information on how you can help these athletes, please write to: Executive Director, United States Swimming, 1750 East Boulder Street, Colorado Springs, Colorado 80909.

By Mark Fineman

A scheme to harness India's sacred waters brings tempers to a boil

Proponents say damming Mother Narmada will help the poor. Opponents say it will make the rich richer. Maybe they're both right

If a new dam is built in this part of India's Narmada River basin, these roaring falls will be submerged.

Jagannath Prajapathi sat cross-legged on the concrete slab he calls his bed, half-hiding the stumps of the toes that were taken by leprosy in the years before the river cured him. He reckoned his age at 60, maybe 62, he said, gazing out of his stark temple dormitory at the water rushing by, as if searching the current for answers he'd forgotten. He wore no shirt or shoes, just a band of khaddar wrapped around his waist. His long white hair was tied back with a bit of discarded string. Everything he owned in the world fit easily into the rusty coffee tin beside his bed.

Prajapathi is one of many thousands of Hindus since ancient times who have performed the *pradakshina* of the Narmada, a religious rite that involves walking every inch of both banks along the 800-mile course of one of India's holiest rivers. It took him two and a half years to complete the trek. Purged, he said, of the disease that had eaten his body and forced him from his family home, he ended up where we found him in the sacred Indian city of Maheshwar, well below a mark that had been painted onto the side of a nearby temple to Lord Shiva, the destroyer. The mark indicates the height the Narmada might attain here when modern technology finishes with her.

Now under construction downstream is a superdam so enormous that it will, by the time it is completed at the end of this century, generate enough electricity to supply thousands of villages and towns, and store enough water to irrigate millions of acres of cropland. It will also drive somewhere between 30,000 and 100,000 people from their homes by flooding nearly 150 square miles of land—an area more than six times the size of Manhattan.

"Will the big dam rob the Narmada of its healing powers?" I asked the old pilgrim.

"There are other dams on other rivers," Prajapathi said slowly, after a thoughtful tug on his beard. "Have they lost any of their sacredness? No, I think not. For those people who are forced away from their homes and villages, it will be very difficult, of course. But for me, there is no problem. Even when the water comes, I will stay here on my bed, waiting to join Mother Narmada forever."

It was a poignant moment that came near the end of my own journey, a drive with an interpreter, Subramaniam Gopal, covering 550 miles through the areas of the Narmada River basin that will be submerged in just a few years' time. Unlike Prajapathi's quest for purification, my pilgrimage was a search for truth. I

Women wrapped in saris bathe in plummeting waters near the Narmada's source to receive blessings from the holy river. During annual festival honoring the Hindu god Shiva, thousands of pilgrims reenact this ritual.

wanted to assess the likely human impact of this monumental, and monumentally contentious, undertaking. "The unique feature of this project," declares a slick yet candid brochure published by Gujarat, the Indian state that stands to benefit the most from the dam, "is that it is the most investigated and debated but the least implemented."

Small wonder, when you consider what's involved. There is not just one superdam, the Sardar Sarovar being built in Gujarat. The grand plan for developing the entire Narmada basin over the next 40 or 50 years calls for yet another superdam in the neighboring state of Madhya Pradesh, as well as 30 additional large dams, 150 medium-sized dams and 3,000 smaller dams, dikes and irrigation schemes along the entire length of the river and its tributaries. The World Bank, which is at once a financing partner, occasional cheerleader and part-time policeman, considers it one of the most

Photographs by David Beatty

At Mandla in Madhya Pradesh, mist rises from the river beyond ghats, broad flights of steps on the bank.

ambitious Third World irrigation and power projects ever contemplated.

It's no surprise that an undertaking of this magnitude has ignited a king-size controversy. Boosters characterize it as a dream come true, a recipe for feeding 20 million famine-plagued people, a pathway to industrial development. They say the dam will protect 750,000 people downriver from chronic monsoon flooding. Critics damn it as a nightmare, an ecological catastrophe that will eventually displace up to a million people, ruin soils, introduce health problems and silt up much sooner than is predicted. Its benefits, they insist, have been vastly overstated. One thing is sure: it didn't spring up overnight.

Soon after India's independence from Great Britain in 1947, the struggling nation's newly emerged states began to argue over resources, including the rivers that flow through them. In the case of the Narmada, the principal fight was between Gujarat, Madhya Pradesh and Maharashtra, which touches on the river for 40 or so miles along an east-west course that literally divides the Indian nation in half. So great was the debate that two high-level tribunals had to be created. The transcripts from their hearings now fill several rooms, floor to ceiling, in the national capital of New Delhi.

The last of those tribunals established the present framework for development in 1979, but the debate did not end there. Even after a final order was issued setting maximum heights for future dams, and fixing the percentages of power and water each of the states was due, arguments continued to rage over the environmental and human consequences of clearing the land needed for the dams' huge reservoirs. The most difficult question: Where and how to move a large, impoverished population, which includes thousands of people from culturally threatened native groups?

For the world's growing ranks of anti-dam environmentalists, overpopulated India was already a prime

From Amarkantak (opposite) in Madhya Pradesh, the Narmada flows west 800 miles to Gulf of Khambat.

Ghats are for bathing and washing clothes. Engineers say the new dams (see map below) won't flood them.

The Sardar Sarovar dam will create huge reservoir to generate electricity and supply water for irrigation.

target, having virtually ignored the welfare of vast numbers of villagers who had to be relocated during earlier dam projects. That dismal track record also made the villagers who will be flooded out by the Narmada dams an easy target for recruitment to the activists' cause. So, when environmentalists from throughout the world began descending on the Narmada River valley several years ago, the stage was set for an increasingly militant conflict in village after village along the river's once-bucolic banks.

In a provocative book published in 1988, activists Claude Alvares and Ramesh Billorey buttress the environmentalists' position with pages and pages of appendices and documents. *Damming the Narmada: India's Greatest Planned Environmental Disaster*, from Natraj Publishers in Dehra Dun, charges that the Narmada projects are "part and parcel of India's post-Independence, elite-oriented development path." The writers assert that the benefits of the dam projects will accrue largely to corrupt bureaucrats, business interests and upper-class farmers, who already rank among the most powerful and wealthy in all of India. The human costs, they emphasize, will be borne by tens of thousands of already threatened and impoverished "tribals," a term commonly used on the subcontinent to denote its original inhabitants. These people will now be forced to live far from their ancient lands.

This argument, brought home through a series of rural rallies and demonstrations, has been a powerful one in the largely neglected villages targeted for flooding. As an expression of their outrage over the dam, one group of tribals in Maharashtra took up bows and arrows late last year and declared "war" on the government. Baba Amte, an elderly Indian social worker internationally recognized as a near saint for his work with lepers, adopted the cause, moving into a concrete hut in a soon-to-be-submerged village near Barwani and pledging to remain there until the dam is stopped or he is drowned. In many threatened villages, thousands of pledges have already been signed by families promising to leave behind one member each in sacrificial protest when the flooding begins in 1994.

For many villages, a very uncertain future

In the words of Abdul Salam, a World Bank sociologist who has visited many of the villages from his base in New Delhi, the activists have done an "excellent job" of radicalizing the villagers. "It is very remarkable when you consider they have been working for just five or six years and with hardly any resources. In Maharashtra, for example, only six of the affected villages have agreed to move. Many others have refused to even talk about the dam. For them, it's a matter of life and a very uncertain future."

Flowing under bridge (opposite) at dry season, the Narmada looks puny compared with immensity of the Sardar Sarovar construction site. Stanchions on the hill (above) anchor cables that carry buckets of concrete.

But the passion is just as strong on the other side. In the halls of power of Gujarat State, several of the officials of Sardar Sarovar Narmada Nigam Ltd., the government corporation set up to build the first dam, have devoted as much as half of their lives to making it a reality. It is their dam, the Sardar Sarovar, that has taken center stage. Unlike the rest of the basin projects, which are still mere proposals, the Gujarat installation is well on its way. More than a dozen of the 64 concrete sections that will form the dam are already in place in and along the riverbed in eastern Gujarat. So are the two pairs of mountaintop stanchions, standing nearly a mile apart on either side of the river. These towers anchor cables that convey huge buckets filled with concrete for pouring the dam. Well over a quarter-billion dollars has already been spent, including almost a sixth of the $300 million committed by the World Bank. It is estimated that this dam alone will eventually cost at least $1.6 billion. Thousands of workers are employed here, and hundreds of families have been moved from the future reservoir area.

"Please, just forget all this talk about the dam being stopped!" shouted Chandrakant Patel, chairman of Sardar Sarovar Nigam, when we asked him about

Power for industrial development will be generated by six giant turbines in huge underground powerhouse.

opposition—opposition that convinced the Japanese government to suspend payments last summer after providing about a tenth of the $150 million it had promised to help finance the dam's six hydroelectric generators. "The project will be completed with or without the Japanese, with or without the World Bank. If it is stopped, there will be a revolt on the streets of Gujarat. And please, don't think this is a fairy tale."

For Gujarat, one of India's wealthiest yet most drought-prone states, the Sardar Sarovar dam amounts to a godsend. The cost of drought relief there in the past five years has averaged about $160 million annually. If one believes the Nigam brochures, the dam, when completed, will make 15 billion gallons of water available every day to 75 percent of Gujarat's population, irrigate nearly 7,000 square miles of land and generate 1,450 megawatts of power, enough to fuel an industrial boom across the state.

What is *not* mentioned in those brochures is the fact that a main canal tied into the dam—at 281 miles in length it will rank among the world's largest water-supply canals—will not be completed until the turn of the century, at the earliest. Until then only part of the land to be irrigated will actually receive water. There is another problem. Despite creation of the huge reservoir behind the dam, few farmers in Madhya Pradesh will benefit. "We recognize that we have a public relations problem," C. K. Koshy conceded as he opened a map of the project. Koshy was until recently the urbane, civil servant director of Nigam and one of its cooler heads. "But the problem has been there for millions of years. When water flow is dependent upon gravity, you have to rely on the lay of the land. And the fact is, the tribals who complain they will not get any water live up there in the mountains, and the water cannot run uphill."

The World Bank, which decided recently to continue funding the project only after conducting a hard internal review, is not as optimistic as Nigam's brochures. It concedes that the project's benefits will be significantly reduced if the second superdam is not built upriver in Madhya Pradesh. The two dams, in fact, were supposed to be constructed simultaneously. But Madhya Pradesh, by far the poorer of the two states, has so far lacked the necessary resources to start its own dam, which will be called Indira Sagar, and now the World Bank is reconsidering whether to fund that one at all.

Still, Gerald Fauss, an American engineer with the Bank, remains convinced that both dams are necessary. In a nation that gets most of its annual rainfall in just three or four monsoon months, he says, "you either have huge flood waves rushing down this river or almost nothing at all. You've simply got to find a way to store that water. And, frankly, if you're going to solve the problems of India in the magnitude they exist in today, you've got to think big."

On the issue of resettlement, Fauss praises the Gujarat dam site as nothing short of a minor miracle. "Here they are, flooding 150 square miles, and you only have to remove some 40,000 people," he says. "We're lucky it's not 400,000 people. From that perspective, it's a pretty darn good reservoir site."

Mark Fineman, who is the South Asia correspondent and New Delhi bureau chief for the Los Angeles Times, *has been reporting from Asia for eight years.*

Bedridden Baba Amte listened to a fellow anti-dam activist lecture an official in New Delhi last May.

Protesting tribal villagers armed with bows and arrows rallied late last year upstream from the dam project.

Perhaps so, provided you're not among the 40,000.

To get an idea of what's at stake, Gopal and I drove into the deeper reaches of the Narmada basin. It is a region rich with centuries of folklore and legend. Indeed, the Narmada has been one of India's most sacred national treasures for more than three millennia. In the ancient Vedic scripts it is said to have sprung from the body of Lord Shiva, and devotees maintain it is holier even than the Ganges (SMITHSONIAN, September 1985). Many Hindu priests say that to free oneself from sin, one has the following choices: bathing for three years in the river Sarasvati, for seven days in the Yamuna or for a single day in the Ganges, while merely sighting the Narmada is sufficient.

We began our journey at the dam site itself, where antiquity and the modern age begin their collision course in a kaleidoscope of conflicting imagery. During the five-hour drive to the dam from the Nigam's modern corporate headquarters in the state capital of Gandhinagar, we were struck full force by the contrasts that access to an abundance of water creates. Early on we passed through lush green farmland crisscrossed by a vast network of long-established irrigation canals and high-tension power lines. It was anything but a land in need.

When we continued into the Kheda region, the road was dotted with additional signs of wealth—new, million-dollar temples built with the repatriated largess of the local Patel families, who are renowned for the hundreds of profitable motels they own throughout the United States. Then came the booming company town of Fertilizernagar, an entire metropolis built by and named for the byproduct of cow manure.

Bug-infested wheat to a starving India

As we neared the dam site, though, we entered an area that was not irrigated. The villages appeared poorer, the land more arid and the peasant farmers a bit more ragged. Then suddenly, on a rise in the road overlooking the Narmada River valley, we entered a strange new world of bulldozers, tractors, overhead cranes and rumbling concrete-mixing plants. At the door to the comfortable Circuit House, a hotel that over the years has housed scores of officials from the World Bank and its member nations, we were greeted by Babubhai Parmar, chief engineer of the Sardar Sarovar dam.

Perhaps more than any other official we met, Parmar is a believer. He remembers with anger and disdain waiting in long lines as a child for the bug-infested wheat that was then being supplied to a starving India by the United States, and he passionately believes that dams such as this are India's only survival tool for the next century, when its population of 820 million

The feast is Europe. And you are the chef.

KLM Royal Dutch Airlines presents a travel program with an inspired difference. It lets you create the European trip you believe will most appeal to your palate.

The program is called Europe By Design,℠ and we begin by presenting you with an intriguing menu of cities, hotels and a series of exclusive excursions—each one chosen for its ability to provide an insider's view of Europe. You might choose to start with some cross-country skiing across Alpine glades near Zurich, then blend in a visit to a bookbinder's studio in Old Rome, and top everything off with a massage or some other revitalizing specialty of the Yverdon-les-Bains spa near Geneva.

You make your selections, and KLM takes it from there. We arrange all details of travel, lodging and excursions. As a result, we can offer you your personal journey at rates more typical of large group travel.

To whet your appetite with more details, contact your travel agent. Or call KLM at 1-800-777-1668 and we'll send along a free 116-page vacation planner.

KLM Europe By Design.℠

KLM
Royal Dutch Airlines

will cross the billion mark. "We are worrying about starvation while the environmentalists are going on and on about trees," Parmar said angrily during a heated defense of his project, which will flood 28,000 acres of officially designated forestland.

"Even without the dam," he went on, "the trees are being cut. Many places have no trees at all anymore because the people needed fuel for warmth and cooking. Besides, we are replacing these trees already. Many thousands of acres of forests are being planted that will more than replace what my dam takes away. I agree that forests should be there. But we need the power and the water this dam will bring simply if we are to survive in the next century. And personally, I would rather build my dam than pollute my environment with power plants."

It was a compelling argument. To demonstrate the magnitude of what's at stake, the engineer escorted us on a tour of his sprawling dam site. At the two mixing plants that are producing the 23 million cubic feet of concrete that will form his 470-foot-high structure, Parmar proudly announced that, in sheer weight, his will be India's biggest concrete dam ever. Then he took us through a 2,800-foot-long tunnel to an underground hall, measuring 680 feet in length and 197 feet in height, that will house the six giant hydroelectric turbines. To create that awesome space, hundreds of Indian tunnelers spent two years drilling, scraping and carrying more than 236,000 cubic feet of rock out of a mountain on the riverbank.

Throughout our tour, there was much evidence of what veteran observers of the subcontinent call "the two Indias." While earth-moving machines were tearing their way through the mountain rock, peasant farmers down below were tilling their soon-to-be-flooded fields with wooden plows pulled by oxen. Farther downstream, diggers dredged gravel and sand from the riverbed to be used as the raw material for the dam's concrete in a process that finds the Narmada literally being used to dam itself. And, beneath the sleek high-tension cables that carry the concrete buckets, dozens of tribal women who will be forced from their nearby villages when the dam is completed were ferrying supplies for it in head baskets.

We broke from our escorts at one point and approached two of the girls who were laboring at the site. They said their names were Jamuna and Ganga. They were sisters, in their teens, whose village of Mokhadi adjacent to the dam site will be inundated. We asked Jamuna, the elder, whether she realized she was actu-

Rare fertile land like this in Madhya Pradesh will be flooded when dam is finished and river begins to rise.

In Kutch region of western Gujarat, women desperate for water must scoop it from the bottom of a hole.

ARRIVE IN GRAND STYLE.

For gift delivery of Grand Marnier® Liqueur (except where prohibited by law) call 1-800-243-3787.
Product of France. Made with fine cognac brandy 40% alc/vol (80 proof). © 1989 Carillon Importers, Ltd., Teaneck, NJ.

A worshiper contemplates sculpture of Shiva's bull, Nandi, in Kala Hanseshwar shrine at Hapeshwar, a few miles from the dam site. The builders have promised to replace this shrine if it, like any number of other temples and shrines, is inundated by the project.

ally helping to build the dam that will drive her family from their ancestral home.

"Yes, I know," she answered softly.

"Is that good?" we asked.

"Well, we will have to leave."

"But aren't you unhappy about that?"

"Yes, no one likes to leave their home. I don't like this dam at all."

"Then why do you help build it?"

"I cannot speak about such things."

As Jamuna quickly returned to her work, a foreman explained that the girls are among 2,000 or so local tribals who work as laborers at the site for a daily wage of 25 rupees, about $1.40. They have little choice, the foreman said. "Their land has no future, so they must earn what they can, while they can."

Back at the Circuit House, we found large color photographs on the wall professing the success of Gujarat's program of resettling villagers. Using the vocabulary of the dam promoters, who refer to the evacuees as "oustees," the captions declared "Oustee enjoys catching fish at new site at Sandhiya" and "Loving welcome to World Bank Mission by oustee girls at Parvata new site on 9th February 1990."

The next day, traveling on our own in Madhya Pradesh, Gopal and I set out for the new resettlement site at Parvata to see for ourselves. When we reached the remote town, we did not receive a loving welcome. "The land is bad," declared Ramsinh Khalfa when he greeted us at the door of his family's tiny compartment inside a row of tin sheds. The government supplies the sheds as temporary housing until the villagers can build new homes on allotted land nearby. Families must house as many as eight people in each 12-by-20-foot dwelling, and in the summer the temperature inside the sheds rises above 110 degrees F. "But we are not that unhappy in the tin sheds," Khalfa explained. "It is the land that makes us so sad. We live, after all, not for luxury. We live for the land. And half the land the government gave us is full of rocks."

At 70, the tribal elder is precisely the kind of "victim" the environmental activists are seeking to protect. His once-reclusive people, called the Tadavis, have long since established contact with the outside world, as India's sprawling population enveloped their ancient forest retreats decades ago. But by actually moving them from their traditional hunting and fishing grounds, the activists assert, projects like the Sardar Sarovar are forcing the tribals into a strange new world where they cannot cope, ultimately laying the groundwork for their cultural extinction.

The Gujarat government is supplying tools, transportation and other benefits for all the evacuees who choose to accept resettlement land. It also is providing each adult male with five free acres of land, although, as Khalfa's family learned, the land is not always of the best quality, or at least is not the kind they know how to farm. In all, Gujarat has allocated a total of $170 million for resettlement. Nevertheless, dam opponents maintain that such measures are far from adequate.

The problem lies in the geography of the project.

1990 Peugeot Motors of America, Inc.

1991 405 models from $15,300 to $21,700.* Call 1-800-447-2882. In Canada 1-416-566-1900. *MSRP. Excludes tax, title, options, registration and destination charges.

How you see the Peugeot 405 S depends on how you look at it.

A glance will probably note the leather seats, but miss the two densities of foam used to eliminate seat springs which transmit road vibration. It might take in the six-speaker anti-theft AM/FM cassette stereo system, but miss the hydraulic-powered anti-lock braking system.

A more discerning eye will see Peugeot's passion for building cars which do not sacrifice any one element for another, but aim to provide the optimum balance of all aspects of the car.

Something which, if you haven't yet experienced, you are certain to appreciate.

A farmer in Gujarat State stacks hay on the roof of his livestock shelter. His hilltop farm near village of Panchmuli is likely to be surrounded by waters of the nearby reservoir, but he refuses to leave the land that once belonged to his father and his grandfather.

Performing an age-old chore, tribal girl fetches water from the Narmada. Her village, too, will be flooded.

Although the dam itself will be in Gujarat, the major flooding will be in Madhya Pradesh, the largest state in India. Of the 245 villages that will be affected in the three states combined, 193 of them are in Madhya Pradesh, while only 19 are in Gujarat. Madhya Pradesh, which already ranks among India's poorest and most backward states, has little fertile land left to offer. And, as we were to learn as we continued our journey, the growing jealousy and animosity between residents of the two states has left few Madhya Pradeshi families willing to accept Gujarat's offer of land.

On the road that crosses from Gujarat into Madhya Pradesh, we saw firsthand the depth of the contrast that has led to conflict between the two states. First came the border crossing, a rural outpost where Gujarat's wide and well-paved highway instantly gave way to a pitted and crumbling road in Madhya Pradesh; it was barely wide enough for a small car. The rich fields of Gujarat were transformed into a wasteland of dust. A horizon of mud-and-straw tribal huts replaced the red tile and stone of Gujarat.

"Welcome to the jungle," our driver said suddenly. "It's dangerous here at night. No single car travels alone. We go in twos or threes. It's the tribals. They stop the cars by blocking the road with rocks and then ambush you with bows and arrows. If you give them all your money, usually they let you go. But I've heard about lots of people getting killed here. It happens once or twice a month. It's not really the tribals' fault, though. They were forced out of the forests and into this place, and nothing will grow here."

• Finland • New Zealand • Monaco • Vatican City • Belgium • Luxembourg • Norway • Switzerland • Portugal • San Marino • Faeroe Islands • France • Andorra •
• Liechtenstein • Thailand • Singapore • Philippines • Bahamas • Panama • Malaysia • Uruguay • Canada • Hong Kong
• Taiwan • Australia • Korea • Japan • Peru • Brazil • Israel • Ghana • Austria • Greece • Kuwait • Mexico • Pakistan • Guam •
United Kingdom
Denmark • West Germany • Sweden • Italy • Ireland • Netherlands • Spain •
Save 20% on calls to over 40 countries.

Only with the *AT&T Reach Out® World Plan.*

The sound of a loved one's voice. The laugh of a good friend. You can hear them again and again—and save with the *AT&T Reach Out World Plan.*

With this plan, it's easy for you to call family and friends in over 40 countries and areas, and save 20%* on your international calls.

Only the ***Reach Out** World Plan* gives you so much of the world in one plan with one low $3 monthly fee. And the savings begin with low per-minute costs—you can call Canada for 18¢, the United Kingdom for 59¢, Europe for 62¢, and the Pacific for 83¢.

With this plan you can call almost anytime—15 or more hours† a day during the week. And 24 hours a day on the weekends.

The longer you talk, the lower the per-minute rates go. Because the ***Reach Out** World Plan* lets you enjoy an additional 5% discount on that portion of your call after the tenth minute.

Even better, there's a 5% discount on state-to-state long distance calls made from your home.

And all your international calls will have the clear connections and superior customer service you've come to expect from AT&T.

Let AT&T help you go home, for less. Call today to sign up for the *AT&T **Reach Out** World Plan.*

Call 1 800 222-1776, Ext. 656.

AT&T
The right choice.

*Average savings based on a 10-minute off-peak phone call when compared to AT&T International Long Distance rates. Savings differ from country to country. Call us for a savings evaluation of the ***Reach Out** World Plan* and basic international long distance rates to Canada and Mexico. †Thirteen hours to Ghana only.

©1990 AT&T

Hindu ascetic rests in a holy temple on the river where he has chosen to spend remaining years of his life.

Gujarat's dam won't provide immediate help for the arid tribal villages on that side of the border. Madhya Pradesh's main benefit from the Sardar Sarovar project, and it is a considerable one, is the guarantee that it will receive more than half of the dam's electric power revenues, which it may well use to finance its Indira Sagar. With such an indirect incentive, though, the tens of thousands of Madhya Pradeshis who are being forced out of their villages to make way for Gujarat's reservoir are more than simply perplexed: many have said they're ready for war.

As we cut back toward the river, and the fields grew greener and more lush from local, small-scale irrigation schemes, the venom flowed freely from men, women and children each time we stopped and asked about the Sardar Sarovar dam. The village of Chikhalda was typical. Surrounded by verdant banana and wheat fields, 18-year-old Ashutosh Pancholi explained why he decided to help lead his 2,000 fellow villagers in joining the anti-dam movement. "We have too much electricity already. We have plenty of water. We can grow anything here. Who wants to leave when we are happy. We understand why Gujarat wants the dam. Because of their drought, they're building this. But what are we going to get out of it? Land over there that is worse than our land over here? We're losing everything, and they're getting everything. So, with so much to lose, we are saying we will die before we will leave. That is the war cry of the movement."

One primary source of such passion, which already has driven angry mobs of Madhya Pradeshis into a series of bloody protests, was just a few miles down the road from Chikhalda near the town of Barwani. Lying flat on his back in his hut on the banks of the Narmada, Baba Amte has made a similar pledge to fight the dam to his death. At 77, the Baba, as he is known, likes to tell visitors that he is in his "late youth." In reality, he has lost a half-dozen vertebrae to an incurable, degenerative bone disease, and after four decades of work with leprosy patients, he has selected the dam as his last great battle. "In this country, they're using dams to store the water to power skyscrapers, the five-star hotels and the factories that are polluting our fields, and they don't even see that, under their noses, the common people continue to starve and to thirst."

It is an argument that Baba Amte has brought to village after village, preaching against the dam from his portable cot (p. 124), offering himself for arrest and, on one occasion, camping outside the home of Indian Prime Minister Vishwanath Pratap Singh for four days until Singh agreed to meet him. But there is a religious dimension to the Baba's argument as well. "In India, we call our rivers *lok-mata*—mother of the people. Like a great lady, certainly she can put on small ornaments, like bangles and rings, like dikes and small pumps. But don't bind her up in cement and chains. This will draw off her great power."

Prof. Lokesh Chandra, a Hindu scholar and prominent expert on such matters in New Delhi, flatly disagrees. "Baba Amte is a religious man," he told us, "but I don't share his interpretation of the *shastras* [Hindu scriptures]. The Narmada is one of seven sacred rivers, no doubt even more sacred than the Ganges. Just to see it, you are purified. So, if you can carry the Narmada to more people, through dams or canals, it is a good thing. It is also part of our religious system that you should make water available wherever possible."

A lethal dose of diamond powder

As we continued our journey upriver, though, it became clear that making water available will take its toll on India's legends as well as her land. We passed through the ancient hilltop kingdom of Mandu where, as history records it, the young maiden Rupmati was discovered while worshiping on the banks of the Narmada by Baz Bahadur. He was the last of Mandu's great Pathan kings, reigning sometime in the mid-1500s. Smitten, the king built two lofty pavilions to satisfy Rupmati's desire to gaze over the river at sunrise and sunset. So famous did the romance become that even Baz Bahadur's Mogul enemies, led at the time by Emperor Akbar, heard about it. The emperor himself was so enthralled by the story that, when one of his generals took it upon himself to drive the Pathan king from Mandu in a raid, inducing Rupmati to take a lethal dose of diamond powder, Akbar threw the offending general in jail.

The dams will not threaten Mandu, which is far from the water's edge, but they might submerge Rupmati's

home village, Sarangpur. Worse yet, local guides say, they may well bring an end to the enduring legend that Rupmati's voice can still be heard calling from across the river to her beloved king.

We encountered an even more dramatic instance just above the falls known as Sahastrabhau, near the sacred city of Maheshwar. Located on what will become the back edge of the future reservoir, Maheshwar is home to the temple dormitory where we found the old pilgrim Prajapathi. It was the seat of the Holkar dynasty, which governed this region through much of the 18th century, and it gave birth to one of India's most enlightened rulers, Ahilya Bai.

When her husband, Khande Rao Holkar, died in 1754, Ahilya Bai was the only one of the maharaja's three wives and seven concubines who refused to commit suttee, a religious rite common at the time, in which a widow joined her husband in death by throwing herself onto his burning funeral pyre. After she herself acceded to power in 1767, she put in place what Sir John Malcolm, a British political agent who arrived on the scene just after her death, was to describe as the most visionary and just society in all of the subcontinent. She protected widows, brought Hindus and Muslims together, launched India's first true welfare system and used the assets of her great inheritance to build some of India's most stunning temples along the banks of the Narmada. By the time of her death in 1795, virtually every subject in her kingdom venerated Ahilya Bai as a divine incarnation, worshiping as much her memory as Hinduism's traditional gods in the temples she built. Even today, Ahilya's temples are teeming with pilgrims, and the dormitories that now house and feed devotees like Jagannath Prajapathi are the remnants of the welfare state she introduced. "The Narmada, you see, was the great inspiration for Ahilya Bai," historian Bal Krissana Punjabi told us. "She treated the river like a mother, and she treated her people like the river. She was born on the river. She spent her life on the river. And she died on the river."

A monument to Ahilya Bai was built beneath the largest temple of her creation (below). When the flood waters come, that simple marker will probably be drowned. I asked Professor Punjabi what Ahilya might have to say about the dam if she were alive today. "It's very difficult to know," he replied. "In her times, these problems were not there. In her times, you see, people were not so ambitious or self-satisfying."

The 18th-century temple of Ahilya Bai, dedicated to Shiva by the woman who was one of the region's most progressive and revered rulers, waits for the day when the river she cherished begins inevitably to rise.

For those with enough
and enough

Dodge Dynasty. Only $13,625.*

Many of our competitors attempt to circumvent your sense of reason by flattering you, in the fervent hope that you'll forget about their exorbitant price tag. In contrast, we invite you to assess the attributes of Dodge Dynasty using nothing but cold logic.

Dynasty offers all the amenities you'd expect to find in a luxury car. Like an exceptionally smooth ride. Available V-6 power. Comfortable seating for six. An AM/FM stereo system. Plus essen-

*Base sticker price at time of printing, excluding tax and destination charge. White sidewall tires, $73 extra.

money to throw around sense not to.

tial conveniences like power steering and automatic transmission.

What's more, Dynasty goes beyond luxury to afford you one very important necessity. Safety. We've made a driver's side airbag standard on every Dynasty we build. And for added peace of mind we offer standard front wheel drive and optional anti-lock brakes.

Dynasty also provides you one feature you'd never expect to find in a luxury car: a very affordable price.

Simply put, feature for feature, dollar for dollar, Dynasty is the best value in its class,** bar none. It's little wonder that more and more astute Americans are choosing Dodge Dynasty.

Welcome home, America. Come see what we're made of.

Advantage: Dodge.

**Based on comparably equipped sticker price comparisons at time of printing vs Ward's full-size class. BUY OR LEASE AT YOUR DODGE DEALER.

Buckle up for safety.

SITE: SALON POMPADOUR, HÔTEL MEURICE

REMY MARTIN

COGNAC XO SPECIAL

EXCLUSIVEMENT FINE CHAMPAGNE COGNAC

DEPUIS 1724

est l'eau de vie

By Phil Patton

'High and Low': modern art meets popular culture

From commerce and comics to Picasso and Pop, the Museum of Modern Art's new show examines a dialogue that helped shape 20th-century art

All three: © D.C. Comics Inc.

THE TARGET HAD TO BE SOMEWHERE NEAR THE DECOY...
TEX--HEAD SOUTH! WE'LL CIRCLE THIS LAKE IN ALL DIRECTIONS UNTIL WE FIND SOMETHING!
OR SOMETHING FINDS US!--YOU CALLED THIS PHONEY, JOHNNY--YOU MIGHT AS WELL CALL ALL THE REST!
CAN'T ELEVATE ENOUGH TO REACH THAT GUN IN THE TOWER, JEB!
WE'VE GOT TO GET A BOOST UP FROM SOMEWHERE!
IT WAS LIKE RUNNING A GANTLET... ONLY THIS ONE WAS MADE OF EXPLODING T.N.T. ...
HEY, JOHNNY! I DON'T NEED SMOKE PICTURES TO SHOW ME MY FUTURE--IF WE KEEP ON DIVING THROUGH THIS STUFF!
I READ YOU, TEX! I READ YOU! BUT--HANG ON A LITTLE LONGER!
BLAM!
WHAM!
VOOM!

Panels from D.C. Comics' *All-American Men of War* and *G.I. Combat* series, drawn by Irv Novick (left and right) and Russ Heath, provided images borrowed by Roy Lichtenstein for 1963 *Okay, Hot-Shot* (opposite).

Latrine duty is dirty work, but in the Army somebody has to do it. The buck private, however, was determined it would be someone else. He had talents for higher things, things the Army could use: he could draw. Finally he got a chance to submit his portfolio. The officer who saw it, and who also did his own drawing in civilian life, got him transferred to a section that made posters and signs.

It was 1947 and the private was Roy Lichtenstein, who was to become famous as the artist who turned images derived from action comic books into Pop Art paintings. Mustered out into the art world, he was to far outrank the officer, a man named Irv Novick, who would help create those very same comics.

The story is a neat summary of the complicated relationships—and shifting rankings—between the "high" arts and the "low," as documented in the Museum of Modern Art's new show "High and Low: Modern Art and Popular Culture," on view in New York from October 7 through January 15, 1991. The show, sponsored by AT&T, will travel to the Art Institute of Chicago and to the Museum of Contemporary Art in Los Angeles.

In "High and Low," MOMA—the very bastion of high modernism—pauses to look at the importance of low, or popular, arts in the creation of the art regularly to be seen on its walls. It focuses on the influence of four vital low arts: caricature, comics, graffiti and advertising. One of the most ambitious shows in the museum's history, it assembles a dizzying variety of items—mail-order catalogs, newspapers, photographs of store windows, advertisements—in addition to paintings, sculpture and drawings.

The show's witty catalog is an essential adjunct to the assembled work and vital to an understanding of the curators' implicit argument. In addition to mapping sometimes familiar low-art influences on major modernist artists, the show and catalog are studded with wonderful connections and bits of history. Together they track the Benday dots featured in Pop Art back through the comics to their invention in the latter part of the 19th century by printer Benjamin Day, and compare them with the Pointillism of Seurat. They include

Collection of Mr. and Mrs. S. I. Newhouse jr.

Lichtenstein transposed and simplified these forms, editing and combining them to create a Pop Art style that, with its grid of enlarged Benday dots, has come to look more like a comic than the comics themselves.

Ludwig Collection, Aachen

Around 1911, the Cubists started incorporating clippings from newspapers into their papiers collés.

early images of Bibendum—the Michelin Man (see cover)—and tell the story of his birth in a surrealistic encounter of one of the Michelin brothers with a pile of tires (SMITHSONIAN, June 1986). They watch the transformations of Mickey Mouse in art, from Roy Lichtenstein to Claes Oldenburg, and explore the relationships between George Herriman's *Krazy Kat* and the work of such artists as Joan Miró and Philip Guston. Chester Gould's Dick Tracy is reborn in *Dick Tracy* by Andy Warhol. Jasper Johns' Ballantine ale cans of 1960, memorialized with all the solemnity of bronzed baby shoes, are played off against a Ballantine ale advertisement dating from the artist's childhood. And Roy Lichtenstein paintings are displayed near panels of "Star Jockey," from the *All-American Men of War* comic-book series, drawn in part by Irv Novick.

"High and Low" will also be one of the most controversial and talked-about shows in years at MOMA, an institution frequently criticized of late for simply recelebrating its modernist heroes, from Picasso to Warhol. Any exhibition that puts the *Zap* comics of R. Crumb on the walls of the Museum of Modern Art is bound to get people talking.

Sorting out high and low art and their mutual influences is a tough job, but somebody had to do it—somebody should have done it long ago. The man who took on the job and who did it carefully, thoroughly, and with a consummate sense of the politics of the museum and the art world, was Kirk Varnedoe, director of MOMA's Department of Painting and Sculpture. He believes the relationship of high and low to be, quite simply, one of the key issues of 20th-century art.

Varnedoe is the museum's rising star and a far cry from the stock image of the meek, scholarly curator. A former college football player and rugby buff, he titled his most recent book *A Fine Disregard*—from the phrase uttered about the first player who picked up the ball and helped create rugby from soccer. Modern art, Varnedoe argues, is about breaking the rules of old games to create new games. "High and Low" is also about breaking rules.

Last spring, Varnedoe was in his office working on the show and putting the final touches on the catalog. On his desk sat a container of popcorn designed with "Pop" in a cartoon balloon (the unmistakable imprint of the Pop style of Roy Lichtenstein), a small token of the way high art, too, through commerce, filters into popular culture. The popcorn was a gift from Varnedoe's collaborator on "High and Low," *New Yorker* art critic Adam Gopnik, his former student.

"I think that's Adam now," Varnedoe said as laughter drifted in from the adjoining office. "That sounds like his laugh."

Sure enough, Gopnik arrived, an earnest and effusive young man with intense eyes behind wire-rims. "It

Picasso's *Au Bon Marché* of 1913 contains one of the most direct appropriations of an advertising logo.

Private collection

Russian artist Aleksandr Rodchenko designed bold, graphic cover for first issue of *Lef* magazine in 1923.

was on the subway," he says, "that we came up with the idea for the show." On the subway, appropriately, amid advertising and graffiti, and comic books on the laps of passengers.

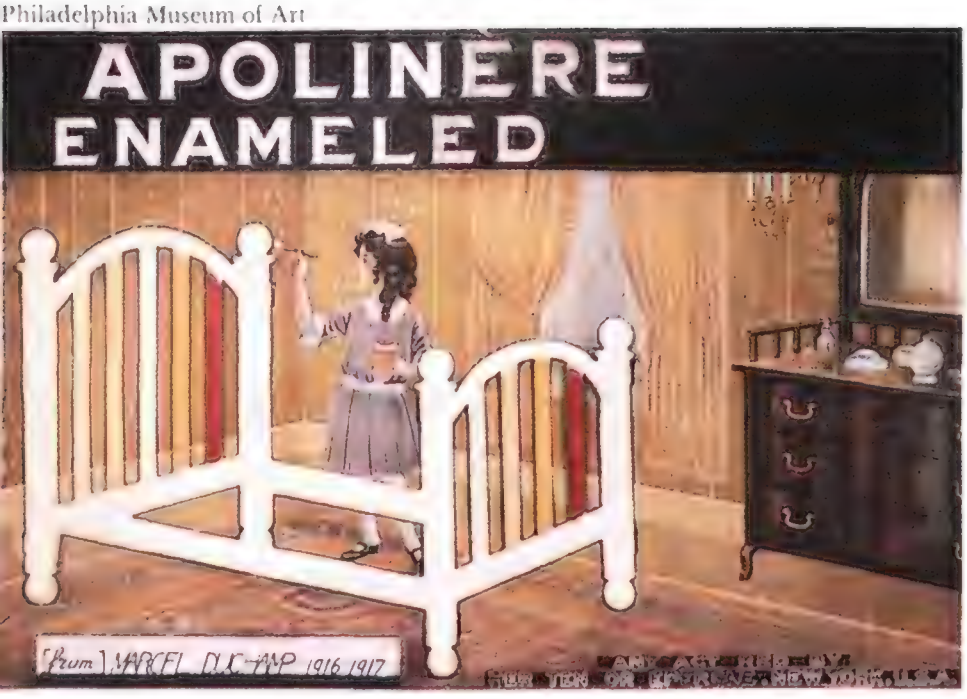
Gopnik and Varnedoe were returning from a lecture by the late critic Reyner Banham, who had spoken on the way in which the "low" construction of American grain elevators and factory buildings had been taken up and romanticized into the "high" architecture of modernism by Le Corbusier, Walter Gropius and others. Banham's ideas struck the note of the pair's common interests. At New York University, Gopnik had heard Varnedoe lecture on the mixing of high art strategies and popular culture in Picasso's *Ma Jolie*. The title of that painting was also the refrain of a then popular song, the equivalent of a Top Ten hit. Varnedoe, for his part, was intrigued by Gopnik's work on the relationship of comics and caricature to modern art.

It is not news that artists have incorporated low materials and the images of low art, from newspaper clippings to comics, into avant-garde art. What is new and important about "High and Low" is its emphatic argument that popular culture has not simply been a passive source for high art, a tabletop of scattered clippings serving as material for it. Instead, the show emphasizes the mutual interactions of high and low. And it investigates the makers of low art, just as Reyner Banham discovered the architects of the original grain elevators.

The standard model of the past, Varnedoe contends, has been that of "billiard balls" of influence, of the "atomic collider": artists see comic books and make paintings like them. But it is all much more complicated, Varnedoe and Gopnik say. "The story has been told in a series of clichés," Gopnik adds, "when in fact it is full of double binds and echoings back and forth."

The interaction worked both ways. The image-filled landscape of the modern city, with its collages of poster

Philadelphia Museum of Art



Marcel Duchamp subtly altered tin Sapolin paint sign to create his *Readymade Girl with Bedstead* of 1916-17.

Museum of Modern Art

Dadaist Max Ernst turned catalog imagery into witty embodiment of his cliché title, *The Hat Makes the Man.*

and billboard, advertising and shop sign, helped inspire the creation of collage. And, maintains Varnedoe, "while we all recognize that there is Dada and Surrealism in advertising, we don't realize how much of Dada and Surrealism *came* from advertising." The appearance ordinary objects took on in posters, the strange juxtapositions of objects in shop windows, and the pages of the "dream books" of mail-order catalogs fed the nightmare worlds of Dada and Surrealism. Says Varnedoe: "One man looks at a Sears, Roebuck catalog and sees a total deadpan inventory, while another sees a hallucinatory fantasy of corsets running together with tractors."

Varnedoe and Gopnik divide the popular art in the show in half: the commercial "overlord" culture, such as comic books, and the "underbelly" culture, exemplified by the "raw, outlaw drawing" of graffiti. Promising to avoid "grand theoretical frameworks," they focus on a number of case studies or "zones of confrontation," as they like to call them. To illustrate one such case of high-low interaction, Varnedoe picks up a copy of a Lichtenstein painting, *Okay, Hot-Shot* (p. 139), a head-on view of a jet fighter pilot who, while the word "Voomp!" explodes beside him, is saying, "Okay, Hot-Shot, Okay! I'm Pouring!"

In tracing the elements that went into the painting, says Varnedoe, "we went to Lichtenstein's studio and found the comics he had clipped from in the corner. Then we obtained the originals from publishers and collectors. The guys who drew them were all living in the New York area. It turns out it was not simply a question of painting and comics, but a question of five specific people in one building working for D.C. Comics, a short subway ride from Roy Lichtenstein's studio." One was Irv Novick.

"What Lichtenstein painted exists nowhere in any one comic," Varnedoe explains. "Its sources are in fact four images put together. The pilot's face is actually taken from that of a tank driver; the 'Voomp!' from another comic. And 'Okay, Hot-Shot, Okay! I'm Pouring!' comes from yet another. The word 'pouring' is also an art world in-joke: a reference to Morris Louis' brand of modern painting, using poured paint.

"Roy makes it bold instead of subtle," Varnedoe asserts. "He adds Mondrian color and radically simplifies the shadow patterns. What he creates is the ideal of a comic that is in his head."

But that comic-book style comes at the end of a long series of transformations, a whole history, from Japanese prints, with their bold foreground composition and radically receding backgrounds that inspired Degas and Gauguin, and which were in turn picked up in film by Eisenstein and Orson Welles. Film, in turn, influenced the comic strips of the 1940s, such as Milton Caniff's *Steve Canyon* and *Terry and the Pirates.* The newspaper strips, in turn, made their way into postwar D.C. war comics. "So," Varnedoe argues, "you have a takedown from a popular takedown from high art from an interpretation of a popular form, Japanese prints. What Lichtenstein has done is to resuscitate it out of the margins of popular style and put it back at the center of painting again."

The strength of the show grows out of the sort of research that enriches the meanings of Lichtenstein's

A frequent contributor to these pages, the author has reported on subjects from skyscrapers to turnpikes. His new book, on American design, will be out next year.

Quality is Job 1.™

"Quality means I can go home and feel good about what I've done."

John Jordan, Welder, Ford Employee for 21 years.

Profile in Quality #28: Commitment

John Jordan realizes that precise spot welds are essential when building a quality car.

John is one of over 366,000 Ford people worldwide who are committed to making quality Job 1.

Our goal is to build the highest quality cars and trucks in the world.

Ford

Ford, Mercury, Lincoln, Ford Trucks.

Ford Motor Company

Buckle up — together we can save lives.

paintings, that brings the history of the comic book in contact with the history of painting, that discovers Irv Novick. Varnedoe, Gopnik and their researchers looked at things previously ignored. As a result, the show presents materials, such as old newspapers, catalogs, posters and comic books, that lend a gritty sense of the everyday to its stories.

Gopnik himself traveled to the Picasso Museum in Barcelona to leaf through Picasso's notebooks. The cartoonlike drawings he found there reinforced his conviction that for Picasso the traditions of caricature had as much to do with the shape that Gertrude Stein's features eventually took in his famous portrait of her as had the primitive Iberian sculpture more often cited as his inspiration. "Low went high in the guise of the exotic," as Gopnik puts it. Picasso also loved American comics; he would stop off regularly at Gertrude Stein's to catch up on the latest *Katzenjammer Kids* strips.

The research, too, turned up all sorts of ironies. Matthew Armstrong, one of the researchers for the show, tried to track down the urinal that Marcel Duchamp famously gave the title *Fountain*, in 1917. "We wanted to know what the urinal thought of itself," Gopnik says. Armstrong faced a tough job. The work involved its own latrine duty: exhaustive research through old catalogs, journals and museums of the subculture of "sanitary pottery."

This icon proved elusive. Duchamp had implied that the urinal came from J. L. Mott Ironworks, a prestigious plumbing supply company with a showroom on Fifth Avenue, by signing it "R. Mutt"—conflating Mott with Mutt of the *Mutt and Jeff* comic strip. But the actual urinal Duchamp chose—a "flat-back Bedfordshire," the very cheapest of its kind—is almost impossible to find today (p. 147). The most common of objects, as Duchamp saw it, is singularly uncommon. "The ultimate Duchampian irony," says Varnedoe, "is that now the original urinal is rarer than a Tang bronze."

Armstrong's research, which included counting the drain holes of various makers' models, suggested something else: that Duchamp's urinal may have been a phony. Varnedoe believes it to be a product of the less prestigious A. Y. MacDonald Company, and therefore not a purebred Mott at all, but a mutt.

For all this detail, and for all the careful restriction of their view to specific cases, Varnedoe and Gopnik have inevitably drawn some more-general conclusions about the interactions of high and low. One is that the pop culture reflected in high art is often older pop culture—frequently that of the artist's childhood seen, as it were, in a rearview mirror. Magritte looked to the classroom instructional charts of his youth; the autos and appliances in Claes Oldenburg's Pop works are the styles of his childhood.

And, reversing Karl Marx's famous epigram about history occurring first as tragedy, then as farce, the curators see elements of low art originally cast in nonserious tones showing up a second time in serious ones. "There's a Beckett-like quality of farce turning into tragedy," Varnedoe says, pointing as an example to the

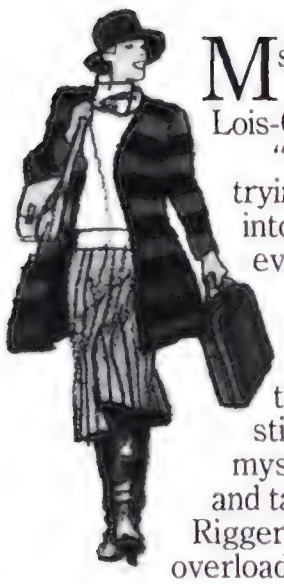
Private collection

A memorial to the tail-fin era, Richard Hamilton's cool and meticulous *Hers Is a Lush Situation* romances the 1957 Cadillac.

Life magazine

The immediate source for Hamilton's painting, above, was ad for '57 Cadillac emphasizing its protruding chrome decoration.

Why this Chicago ad woman leaves her $300 attaché case in the closet and carries our $39.50 Square Rigger.



Ms. Patrice Dermody, Media Director at Lois-GGK, explains it this way: "I constantly find myself trying to jam more things into an attaché than it was ever meant to hold. Office shoes, bills, lunch, you name it. That kind of treatment would break the back of my beautiful stiff-backed case, so I find myself leaving it at home, and taking my canvas Square Rigger to work. It swallows overloads without complaint, and has inside pockets for my calculator, even a snap hook for keys."

And more.

That's not the whole story. The Square Rigger is made of tough yet soft 18 oz. Square Rigger cotton canvas. It has comfortable padded handles. Smooth-operating plastic zippers. Comes in businesslike colors. Pretty impressive for $39.50.

We make the Square Rigger attaché and over a hundred other Lands' End items at our duffle works in West Union, Iowa. That way we can guarantee the best possible workmanship. And sell our soft luggage to you without costly middleman mark-ups.

First quality, then price.

What we have to offer goes beyond soft luggage. Even beyond our great sportswear and accessories. The Lands' End tradition affects everything we offer you.

First, *quality*. Then, *price*. And always, always *service*.

That's why we offer a guarantee that would put lesser merchants out of business. It is unconditional, without limitations of any kind, and consequently, we can express it in two words:

GUARANTEED. PERIOD.*

If we're new to you, we don't ask that you trust us. Just try us. By phone, you can reach us toll-free 24 hours a day at 1-800-356-4444.

Or fill in the coupon. Order a Square Rigger or not, as you like. But let us send you a free copy of our latest Lands' End catalog.

© 1990, Lands' End, Inc.

LANDS' END® DIRECT MERCHANTS

Please send free catalog. Lands' End Dept. B-39
Dodgeville, WI 53595

Ship___ Attachés. $39.50 ea. plus $3.50 shpg.

☐ Tan ☐ Burgundy
☐ Gray ☐ Jade
☐ Navy ☐ Black

☐ Check Enclosed ☐ American Express
☐ Visa ☐ Master Card

Card No. _____

Expiration Date _____

Name _____

Address _____

City _____

State _____ Zip _____

Write or call toll-free:
1-800-356-4444

way the funny papers are recast in the melancholic worlds of Philip Guston's paintings.

In this regard, high and low can move in strikingly similar directions. Consider the affinity between underground cartoonist R. Crumb and Guston (below).

In the 1950s, Guston was a leading Abstract Expressionist. In the '60s, he began painting strange figures with Ku Klux Klan-style hoods or Cyclopean heads, wandering through a world of bare light bulbs, giant cigars and discarded shoes. Their inspiration was in part the comic worlds of *Krazy Kat*, *Powerhouse Pepper*, even early *Mickey Mouse*.

Similar funny-paper sources, along with the dark worlds of E. C. Comics, which were the target of censorship for their supposed sadomasochistic content, fed into the work of Crumb. The creator of such characters as Mr. Natural and Schuman the Human, Crumb became an important figure in late '60s pop culture by combining memories of a lower-middle-class childhood, and reading *Li'l Abner* and *Popeye*, with LSD-induced visions.

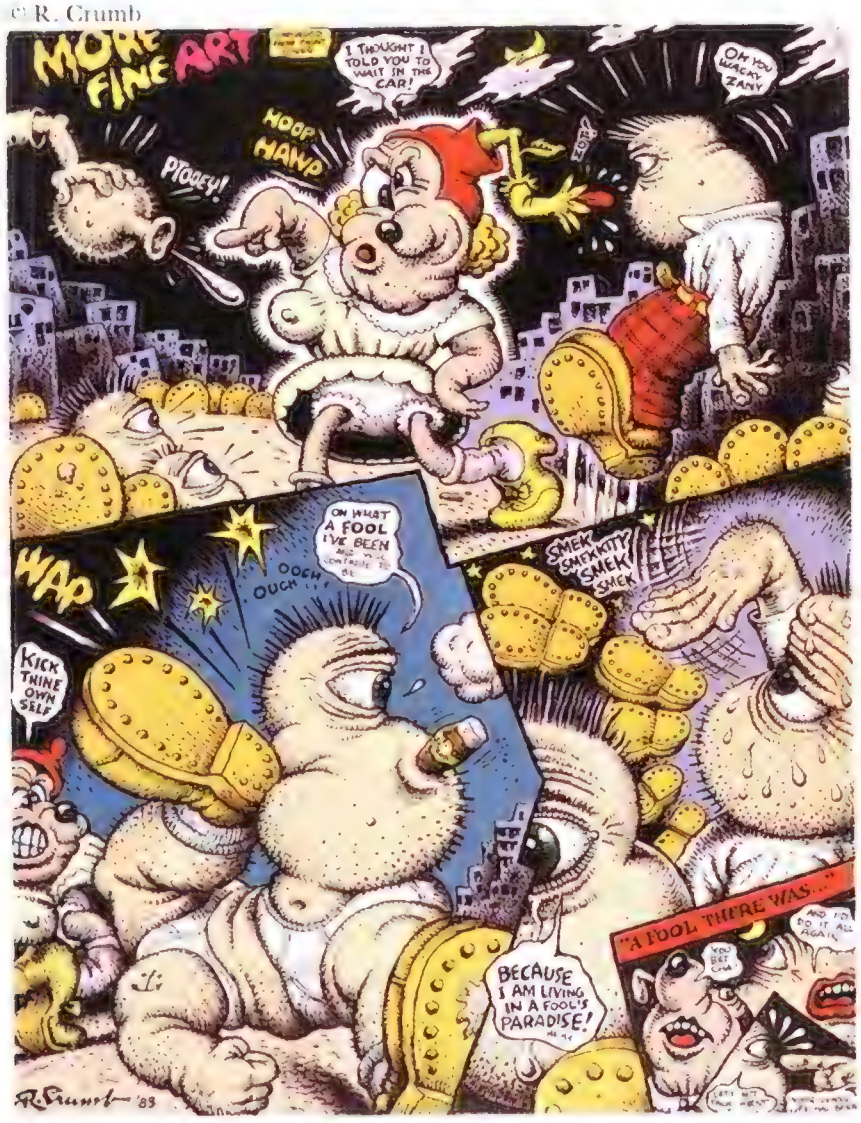
Artists of very different spheres, Guston and Crumb came to similar conclusions from their funny-paper inspirations. Guston, shown Crumb's work, recognized in him a "mordant companion." For his part, Crumb told Varnedoe and Gopnik that after seeing Guston's work for the first time, he felt "as though we had both tapped into this great grungy unconsciousness, all the unconscious imagery of lower-middle-class America."

The reappearance—via this rearview mirror—of older popular images, such as 1930s comics in the '60s art of Crumb and Guston, also belies the common notion that popular culture is necessarily ephemeral. However large the element of fashion and fad in popular culture, Varnedoe and Gopnik emphasize as a corrective its preservationist aspect: Varnedoe calls it a "gigantic freeze-dry operation."

"We have this image of constant, churning innovation," Varnedoe says. "We think of popular culture as fast-changing and ephemeral, but it is also an amazing vehicle for preservation." If something works commercially, it survives—like the Coca-Cola bottle or the Campbell's soup can, both of which go back to the 1890s. By the time Andy Warhol got his hands on these items, they were already established icons.

Varnedoe and Gopnik have a favorite metaphor for the patterns of interaction between high and popular. They call it "Agha's wheel," after graphic designer M. F. Agha. Agha was born in Russia, trained in Germany in the 1920s, and was hired by Condé Nast to bring modern design to *Vogue* and the other magazines of Nast's empire.

© R. Crumb


MORE FINE ART
I THOUGHT I TOLD YOU TO WAIT IN THE CAR!
OH YOU WACKY ZANY
HOOP HAWP
PTOOEY!
WAP
OH WHAT A FOOL I'VE BEEN
OOCH OUCH
SMEK SMEKITTY SMEK SMEK
KICK THINE OWN SELF
BECAUSE I AM LIVING IN A FOOL'S PARADISE!
"A FOOL THERE WAS..."
R. Crumb '83

Private collection

Gritty "burlesque realism" of Philip Guston's *Head and Bottle*, 1975, reaches back to comics style of 1930s.

In homage to Guston, underground cartoonist Crumb adopts stubbled head for 1983 back cover of *Weirdo*.

In 1931 Agha wrote an account of the changing connotations of sans-serif type—the plain, geometric typefaces that Agha scattered throughout Nast's magazines and which today we still regard as "modern"—that is a key story in "High and Low."

Inspired originally by the large wooden type used to print 19th-century posters, the wear and tear of whose use precluded breakable serifs, this type style surfaced in advertisements in the French newspapers from which the Cubists clipped pieces for their papiers collés. The typeface was already disdained—Varnedoe calls it "the oldest, cruddiest typeface"—when set among the flowering, flowing "modern" typefaces of Art Nouveau and its kin.

Varnedoe pulled out a huge sheaf of photocopies of these newspapers to explain. Look at the copies, close your eyes, and you can easily imagine these papers in Picasso's hands as he sits at his café table. His searching eyes note the ads with elaborate Art Nouveau lettering. He encounters, in a December 9, 1912, issue of *Le Journal*, an advertisement for a pen that has already adopted the word "Cubistes."

But Picasso, clipping items now to take back to the studio, ignores all that. Instead, he goes straight to the crude, old-fashioned sans-serif type of the cheap advertisements—the equivalent, say, of today's discounters' newspaper promotions. These are the letters Picasso will incorporate into his Cubist works.

But when Picasso's work shows up in Germany and Russia, the letters are viewed differently. Instead of being viewed as amusingly crude, the way Picasso saw the letters, the sans-serif type was seen in those countries as being as modern as Cubism itself. "And it is not in Paris, the center of the operation, but in the 'sticks'—at the Bauhaus and in Russia—where they look and say, 'Aha, das ist modern,' " Varnedoe intones.

The Bauhaus adopted sans-serif type as a kind of house style, and the Russian Constructivist artists Aleksandr Rodchenko and El Lissitzky, creating advertisements and propaganda for the new Soviet state, used the cleaned-up and mechanical-looking sans-serif types in their paintings and graphics as a symbol of a fresh, rational look. By the time Agha established himself at Condé Nast, the wheel had taken another turn: from the low art of the ads to Cubism to Constructivism to the popular graphic art of the magazine.

"The story is one," the curators write in the "High and Low" catalog, "in which modern art was neither simply an enemy of modern commercial culture nor just an occasional poacher on its territory, but a partner in a complex *pas de deux* of give-and-take: the one drew from the other, and then vice versa."

Sidney Janis Gallery, New York

Marcel Duchamp, father of found-object art, converted urinal into infamous "readymade" titled *Fountain*.

Dorothea and Natasha Elkon, New York

Fautrier with Spidered Brow, 1947, by Jean Dubuffet incorporates elements of both caricature and graffiti.

Curators Kirk Varnedoe (right) and Adam Gopnik take delight in material they put together for MOMA show.

But there is more to the story of sans-serif type, and it suggests just how much a show at the Museum of Modern Art is not only about this history, but part of it. After Agha's work for Condé Nast, after World War II, after Bauhaus design moved to the United States, corporate America adopted sans-serif typefaces—especially the Swiss Helvetica and Univers—as representing the same efficiency and modernity as the glass-and-metal architecture of what the museum had championed as the "International Style."

That type is still to be found in corporate and government logos and signs, on New York City sanitation trucks passing in front of MOMA, and in the signs in the subway station just down the street. Cool, crisp sans-serif type also became the house type of the Museum of Modern Art. Even this show's catalog, Varnedoe and Gopnik point out in its text, is set in a sans-serif typeface. The museum's solid, some would say stolid, support of modernism is perfectly reflected in the sober lettering of its gallery signs, stationery and publications.

The institutional look that typeface today has come to possess reflects the institutional power of MOMA itself. The history of art museums is part of the history of art too, especially now that museum shows have themselves become part of "popular culture." The Pop Art paintings at MOMA inspire items like Varnedoe's popcorn container.

It is in this context that you can see something almost subversive about the contents of "High and Low." Carefully packed in the cratework of its non-ideological qualifications, swathed in the factual Excelsior of the case-study method, "High and Low" smuggles dynamite into the temple of high art. That dynamite is the power of the low art itself, in the original spirit behind the letter.

"High and Low" seems to sound an implicit call to a return to MOMA's younger, more adventurous days and the vision of its deposed founding director, the late Alfred H. Barr jr. Barr, a legend in American art, helped the museum conceive such shows as "Machine Art" of 1934, and admitted photography, film and industrial design as fit subjects for a museum.

Varnedoe and Gopnik do not set the issue in these terms, naturally. Gopnik denies that it was a matter of "young Turks versus the old" at MOMA. Varnedoe admits that "I had to argue for the show" but claims "there was never a flicker of disagreement in principle on doing it; they just wanted to know whether it could be done well. Almost anybody in the museum instantly sees that this is one of the great stories to be told. The main resistance comes from outside."

The reaction among MOMA's traditional audience is likely to be mixed. Varnedoe is braced for it. "You can write some of the reviews now," he said that day last spring. "Their reaction will be to the basic premise—you can't believe how deeply taboo it is for certain people. There are some who think the Modern is a temple of high cultural value and for it to soil its hands with the art of the street and become 'debased' by commerce is absolute anathema."

But the materials of low art that the show brings into the museum simply as influences on high art will, standing with it, assert the power they possess on their own—a power to tap the cultural unconscious that Crumb referred to. Low art, on its own and as a source, has demonstrated a power to move and excite—to create iconic images—that is a challenge to high art, which has seemed increasingly unemotional and formal. (Perhaps this is why the most recent examples in "High and Low" are the most problematic. The inclusion of such artists as Jeff Koons, whose art is no longer even art about art, but art about being an artist in the age of mass media, ends things with a jarring and dying fall.)

A low challenge to high modernism

But it is probably impossible to apply the terms "high" and "low" without treating work tagged with the latter term unfairly. Low art at MOMA is like a long-ignored and somewhat unsavory relative who has finally been invited for an obligatory and rather uncomfortable visit, but whose long-term residence would be unthinkable. One might almost distinguish high and low by whether or not they are acceptable in an art museum.

The challenge low presents to high is also, of course, a challenge to modernism. It was the self-proclaimed Postmodernists who took to the streets with vigor,

challenged us to "learn from Las Vegas" and collected the "vernacular." And part of what "High and Low" attempts to do is to recapture for modernism the ground Postmodernism claims as its own.

"I don't believe that there is such a thing as Postmodernism," Varnedoe says flatly. Instead, he sees "a continuity of what began as a revolution from around 1880 to 1920. It opened up a new set of languages and questions and options. I don't believe those options are over. There has been no comparable watershed since.

"One of the premises of modern art," Varnedoe believes, "is that you cannot define what powerful art is in terms of traditional materials or where it is shown, and this can be disturbing, uncomfortable. The premise when the museum started was that modernism was something that resided in a broad range of things . . . we'd like to reassert that spirit."

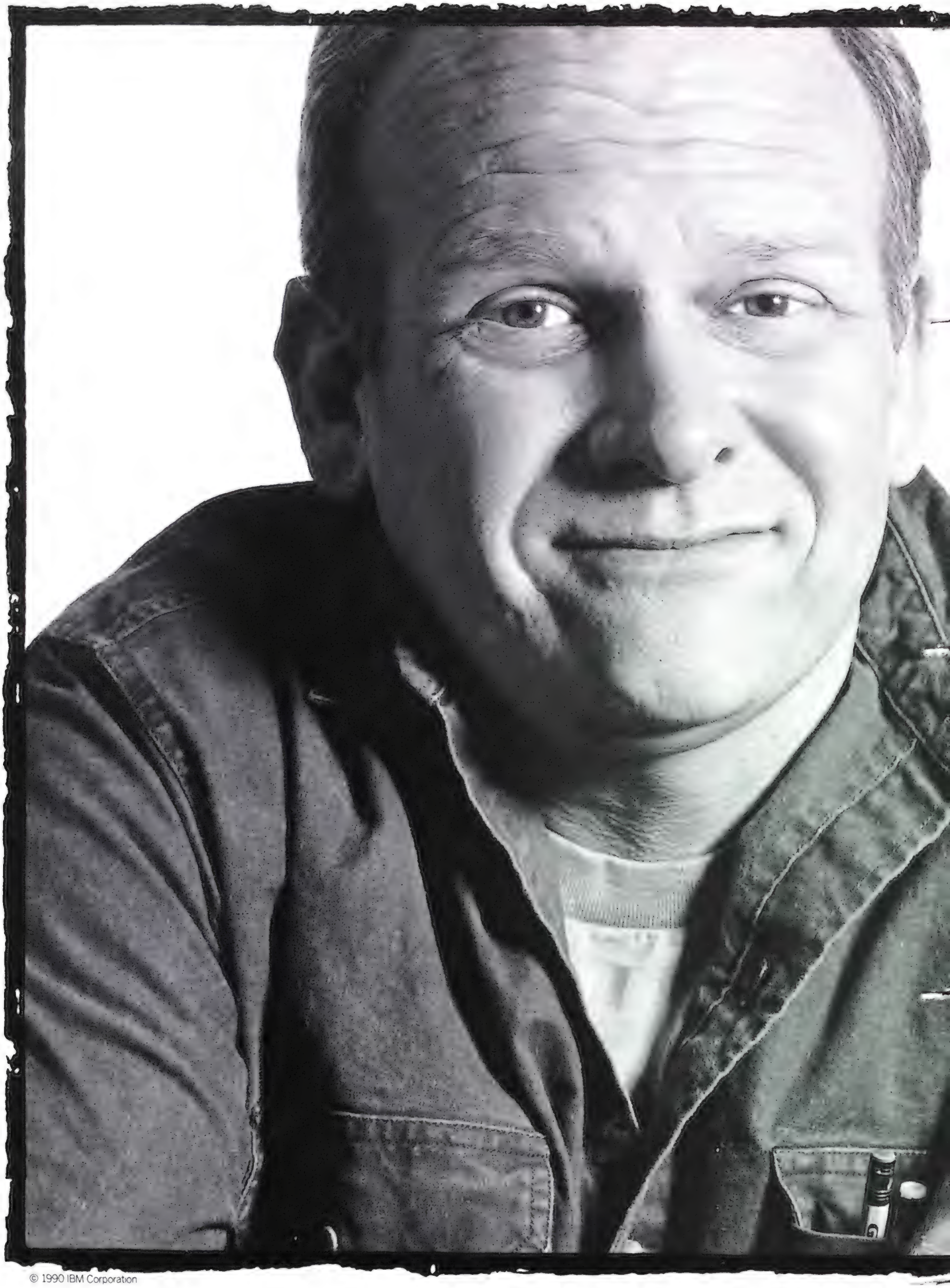
Their reassertion is what gives the "High and Low" show its energy—an energy that the careful premises of the exhibit do not have to restrain. It is an energy that, with a jolt like the Rodchenko-inspired exclamation mark of the show's logo, leaps between images made in separate worlds, but now hung only feet apart.

That energy presents MOMA with both risk and opportunity. A risk, because low art represents a challenge not just to modern art or to high art, but to all "capital A" art, to the elevated notion that has been with us since the twin revolutions of industry and Romanticism did away with the continuum of "arts," from silversmithing to portrait painting, in favor of far grander claims.

And an opportunity for MOMA, at the age of 61, to assert new vitality, to consider that perhaps the ultimate consequence of the modernist revolution Varnedoe speaks of as not yet played out will be the restoration of that continuum, somewhere beyond high and low.

Jacques de la Villeglé appropriated torn posters from public walls and mounted them on linen for his 1968 work *122, rue du Temple.* Artist sometimes "assisted" his found-art collages by further selective tearing.

Museum of Modern Art



© 1990 IBM Corporation

"The idea of computers in the factory used to scare the daylights out of me. Now I run one."

"I figured I'd get burned either way—computers show up and I get fired, or computers don't show up and the plant closes down.

"But what happened is, they retooled the plant and while that was going on they sent me to school, to an IBM-sponsored course at the community college.

"Here are two things I learned. I learned a new job that's better than my old one. And I learned that our plant won't be boarded up any time soon."

Yes, you can teach old factories new tricks, and CIM (Computer Integrated Manufacturing) is one of them. CIM coordinates the manufacturing process, from design to distribution, as a single system. Needless to say, it can make our economy more competitive.

And yes, we'll have to teach people some new tricks, too. That's why IBM sponsors CIM education for students and workers at over 70 colleges and universities across America.

To learn more about CIM and IBM's commitment to CIM education, write to us at IBM, P.O. Box 3974, Dept. 972, Peoria, IL 61614.

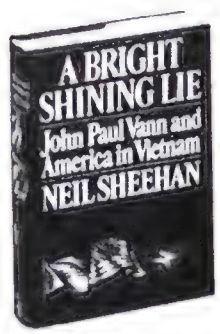
IBM®

TAKE ANY 3 FOR

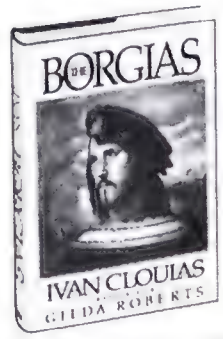
HISTORY BOOK CLUB
The best of history all in one place.

2410. Pub. price $19.95

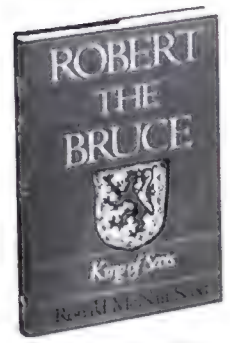
7526. Pub. price $17.95



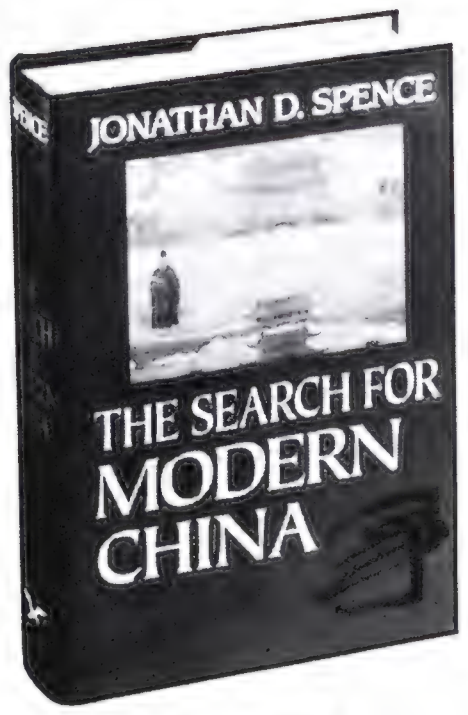
1495. Pub. price $24.95



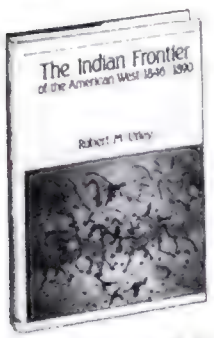
1206. Pub. price $24.95



3467. Pub. price $24



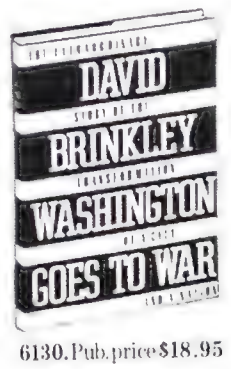
4887. Pub. price $29.95



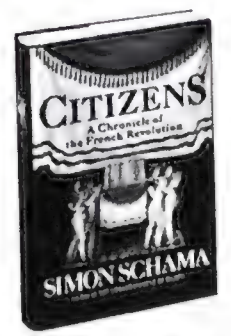
8490. Pub. price $19.95

3947. Pub. price $21.95

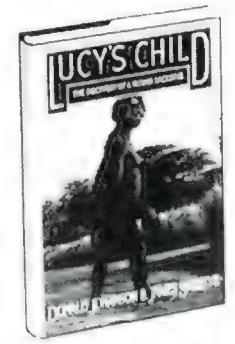
1792. Pub. price $22.95



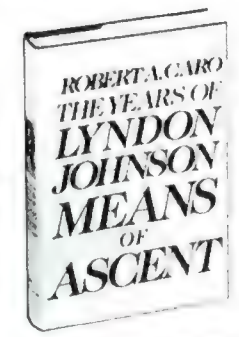
6130. Pub. price $18.95



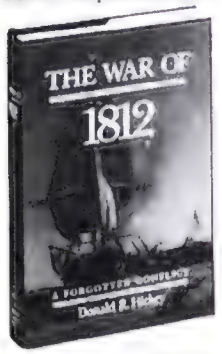
1396. Pub. price $29.95



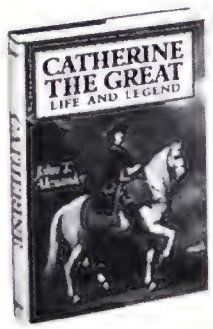
1875. Pub. price $22.95



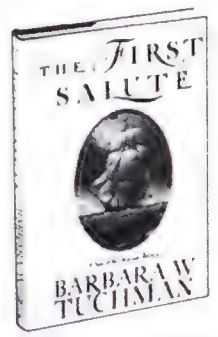
5058. Pub. price $24.95



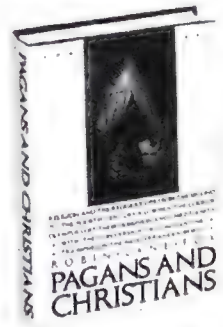
2741. Pub. price $32.50



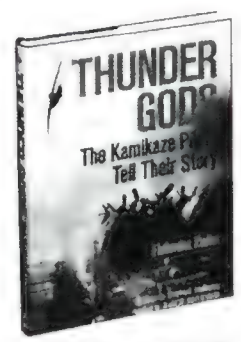
1073. Pub. price $24.95



6080. Pub. price $22.95

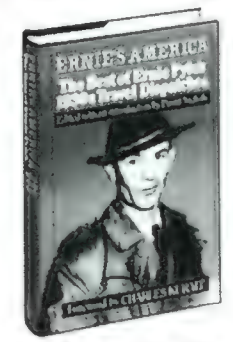


3806. Pub. price $40

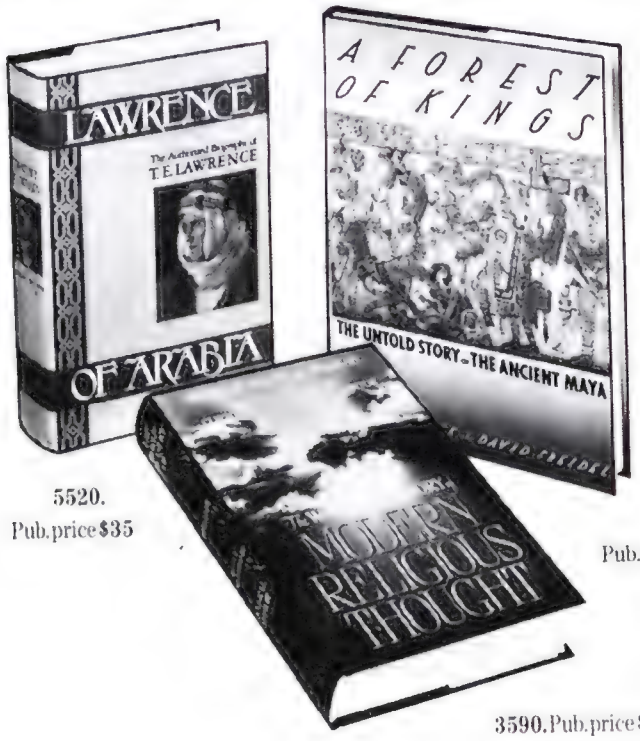


2220. Pub. price $18.95

7005. Pub. price $39.95



2428. Pub. price $21.95

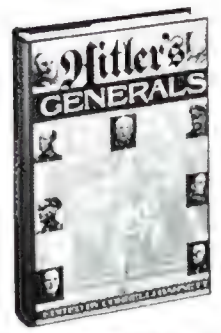


5520. Pub. price $35

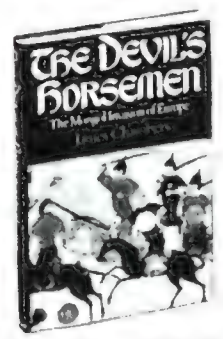
6056. Pub. price $29.95

3590. Pub. price $29.95

5843. Pub. price $27.50

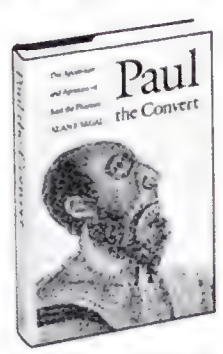


3673. Pub. price $24.95

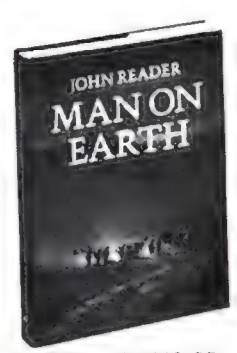


8094. Pub. price $16.95

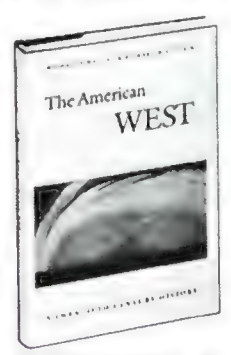
1859. Pub. price $15



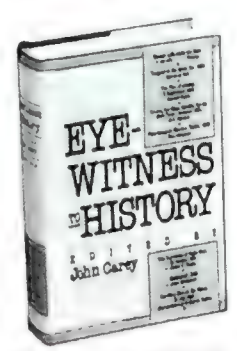
5850. Pub. price $29.95



1677. Pub. price $29.95



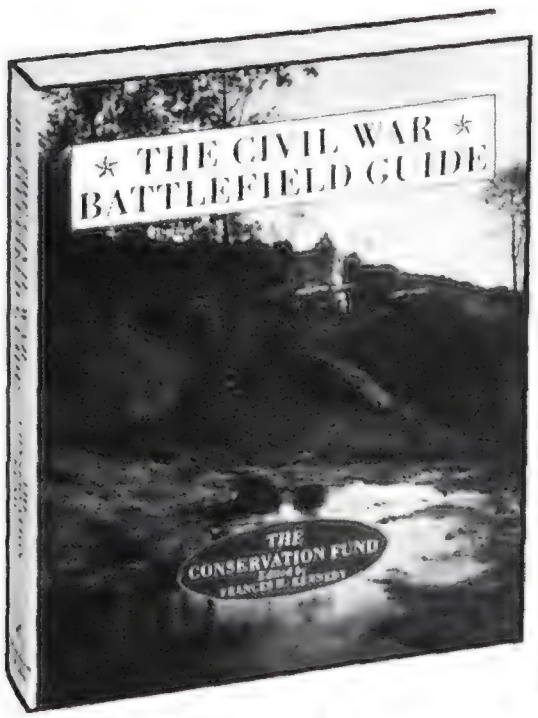
2675. Pub. price $31.50



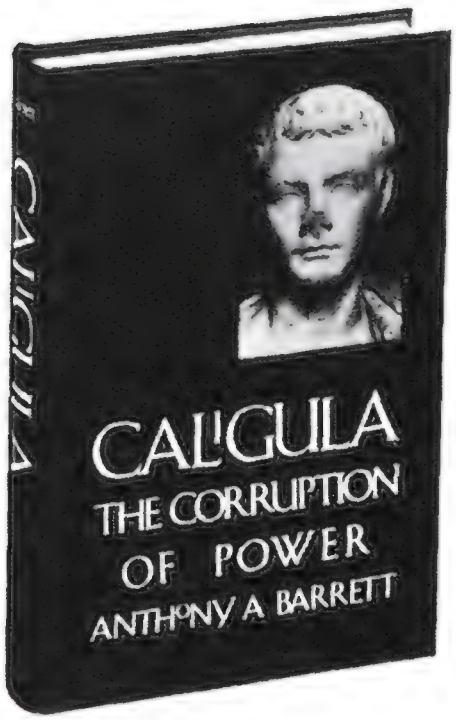
6007. Pub. price $24.95

$1 EACH

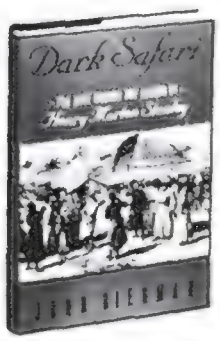
Plus a 4th at 35% off the publisher's price.
WITH NO OBLIGATION TO BUY MORE.



4994. Pub. price $29.95

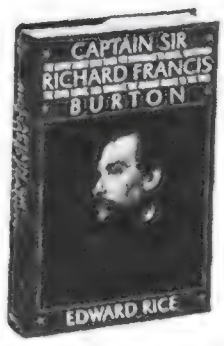


4564. Pub. price $27.50

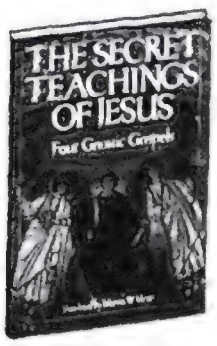


5736. Pub. price $24.95

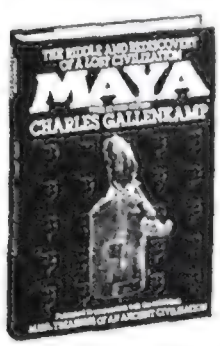
5884. Pub. price $27.50



4838. Pub. price $35

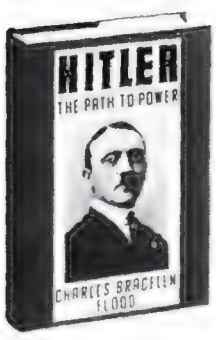


1784. Pub. price $15.95



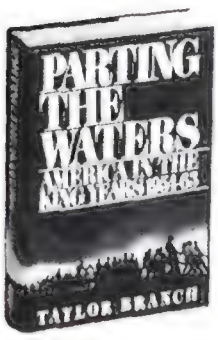
2535. Pub. price $22.95

1636. Pub. price $22.50

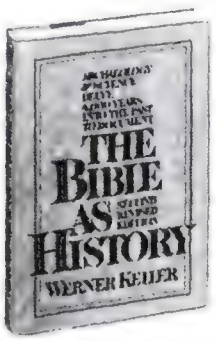


1701. Pub. price $24.95

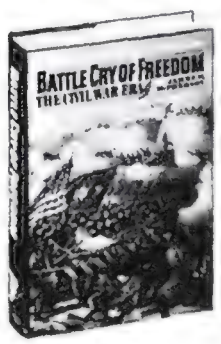
4093. Pub. price $24.95



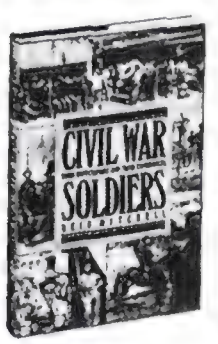
1081. Pub. price $24.95



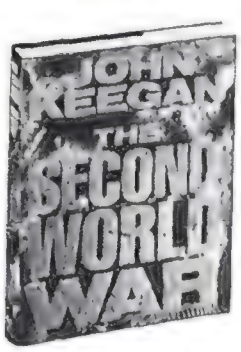
3012. Pub. price $21.95



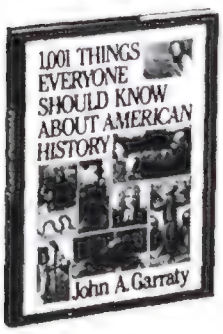
3988. Pub. price $35



2105. Pub. price $19.95

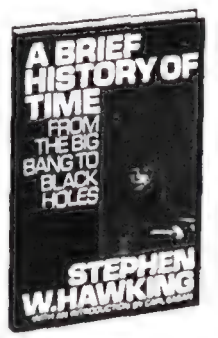


3434. Pub. price $29.95

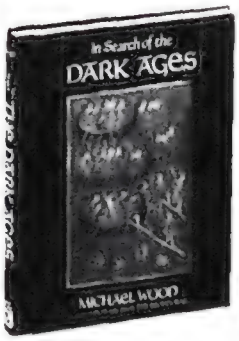


1057. Pub. price $19.95

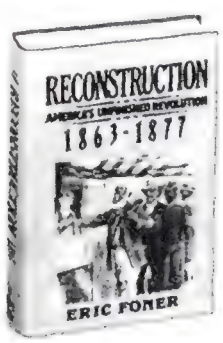
3970. Pub. price $22.95



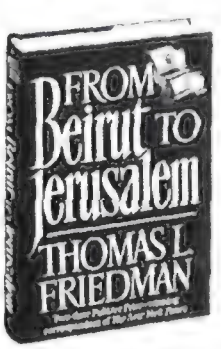
3087. Pub. price $18.95



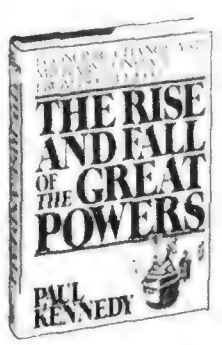
6981. Pub. price $22.95



6767. Pub. price $29.95



1925. Pub. price $22.95



1644. Pub. price $24.95

Save on the best recent history titles.

No matter what area of history you enjoy reading about most, you'll find that History Book Club offers some of the finest selections being published today. And no book club we know offers greater savings—as much as ⅓ off publishers' list prices.

You can save even more by taking advantage of our Introductory Offer. Select any three books on this page for $1 each when you take a fourth book at 35% off the publisher's price, plus shipping and handling. Thereafter, you're not obligated to order any more books. You may cancel membership at any time by notifying History Book Club. We may cancel your membership if you elect not to buy at least one book in any six-month period.

How the Club works. You'll be able to choose from 150 to 200 books featured each month. History Book Club always offers its members well-made, long-lasting editions.

You'll receive our *Review* and a dated Reply Form 15 times a year (about every 3½ weeks), plus up to 4 more offers of special selections. If you want the "Editors' Choice," do nothing—the book will come automatically. If you want another book, or no books at all, return the Reply Form by the date specified. A shipping and handling charge is added to each shipment.

Your HBC guarantee: If you receive an unwanted "Editors' Choice" because you had fewer than 10 days to decide, simply return it and pay nothing.

HISTORY BOOK CLUB®
Camp Hill, PA 17012-8805

Please enroll me in History Book Club according to the no-risk, no-commitment terms outlined in the accompanying ad. Send me the four books whose numbers I have listed below. Bill me $1 each for the 3 choices on the left, and the fourth at 35% off the publisher's price, plus shipping and handling.

H454-11-0

0-19

Name_____
(Please print clearly.)

Address_____ Apt. #_____

City_____

State_____ Zip_____

All orders subject to approval. Prices generally higher in Canada.
© 1990 History Book Club, Inc.

An aspiring American actress, Molly Tompkins introduced herself to Shaw as he strolled on a London street in 1921. It was the start of a tumultuous affair. This photograph and most that follow are from the collection of Molly's son, Peter, who published the G.B.S.-Molly correspondence.

By Arline B. Tehan

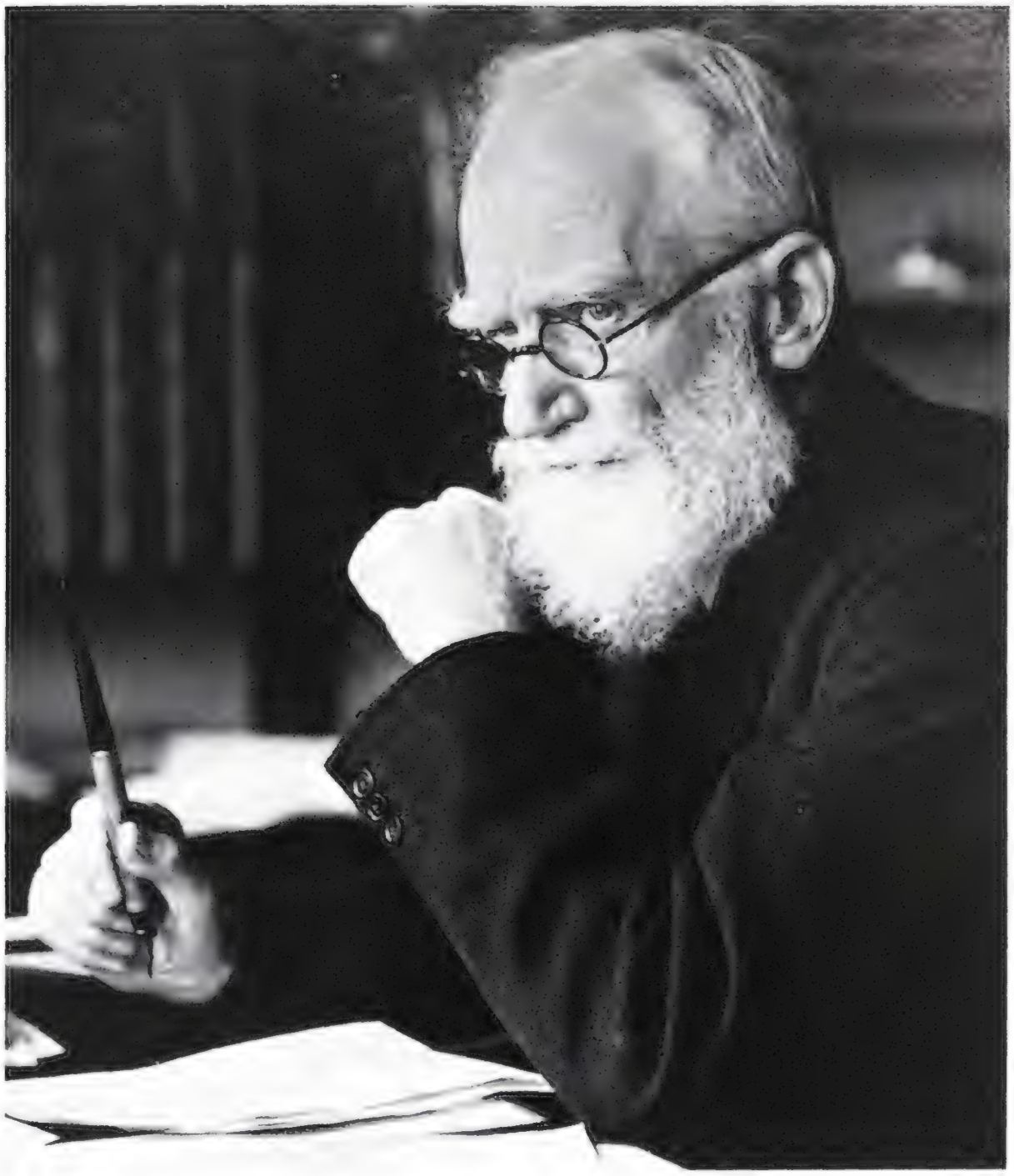
The playwright and his 'Mollissima,' in pursuit of love

George Bernard Shaw in his later years enacted his own romantic denouement with the American beauty who entranced him

"The true artist will let his wife starve, his children go barefoot, his mother drudge for his living at seventy, sooner than work at anything but his art. To women he is half vivisector, half vampire. He gets into intimate relations with them to study them, to strip the mask of convention from them, to surprise their inmost secrets, knowing that they have the power to rouse his deepest creative energies, to rescue him from his cold reason, to make him see visions and dream dreams, to inspire him, as he calls it."

These lines were spoken by Tanner, the male protagonist in George Bernard Shaw's play *Man and Superman*, first produced in London in 1905. They addressed a problem that occupied Shaw, Britain's foremost playwright, for his entire life—the problem of the relations between the sexes.

In 1921, Shaw, a vigorous 65, would find himself struggling personally with this problem for the last time in his life. For more than 20 years, he and his wife, the former Charlotte Payne-Townshend, had participated in a marriage that was, by mutual consent, without sex. Now, with no premeditation, he found himself



After a lifetime of flirtatious dalliance, Britain's legendary dramatist more than met his match in the spirited Molly Tompkins. Shaw was at once captivated and tormented by the aspiring actress' charms: "You are," he observed with exasperation, "really pretty" and "as vain as a goldfinch."

embarked on his last love affair. His willing partner in the liaison was Molly Tompkins, a stagestruck 24-year-old American.

In the first act of their real-life Shavian drama, Shaw assumed the role of Professor Higgins (from his play *Pygmalion*, later to become the hit musical and film *My Fair Lady*) to Molly's role of the Cockney flower girl, played with her "Amurricanisms." By the last act, Shaw had become the ancient Captain Shotover (from his own favorite among his plays, *Heartbreak House*), warding off the advances of Molly's Ellie Dunn. During the affair's often stormy course, Shaw ranged from a tender regard for his "Mollissima" as "an indispensable Vitamin in my bread of life" to furious condemnation of her as "a predestinate damned soul."

Their tempestuous ten-year romance was undocumented by Shaw's biographers until 1960, ten years after his death. In that year, Molly's son, Peter Tompkins, published *To a Young Actress: The Letters of Bernard Shaw to Molly Tompkins*, followed in 1961 by *Shaw and Molly Tompkins: In Their Own Words*. From Tompkins' books, the extent of the romance can be reconstructed, as he is the source of information and photographs on which the story is based. Tompkins plans someday to republish *Shaw and Molly Tompkins* in paperback, elaborating on the intimacy of his parents' relationship with Shaw.

In true Shavian fashion, it was the woman who made the first move in the Shaw-Tompkins affair. Outside his London flat, where Shaw lived in his *mariage blanc* with Charlotte, the enterprising Molly Tompkins approached him as he strode along in rough gray tweeds, the wind ruffling his beard. Tall, beautiful, vibrant, Molly seemed the typical American flapper of the 1920s. A native New Yorker, she was madly ambitious for a stage career—and to meet Shaw. With her sculptor husband, Laurence, and their 2-year-old son, Peter, she had come to London to make plans for a theater back home in Georgia which, "as a monument to Shaw," would produce only his plays. Her husband would design the theater, and she would be the leading actress. Admission, according to Molly's scheme, would be free. At this proposal Shaw roared with laughter, "Good God, don't you know that if people don't

In 1922, Shaw chats with Laurence and Molly Tompkins at a Fabian school; he kept the couple at his side as protection from his fans.

pay for things, they don't want them?"

But her naiveté and enterprise appealed to Shaw. The seductive Molly was gaily unconventional; he soon found she was also headstrong and temperamental. The presence of her complaisant husband reassured Shaw, who preferred for his flirtations married women "who knew what they were doing." Molly's brimming energy was matched by Shaw's own vitality, which constantly amazed his contemporaries. Younger and less sophisticated than her actress predecessors Ellen Terry and Mrs. Patrick Campbell, Molly offered Shaw the gift of her adulation, which Shaw's vanity could not resist.

But Shaw was also a practiced philanderer who had no intention of breaking up his 23-year marriage to Charlotte, a woman of brains and wealth and strict conscience. Although they lived platonically, Shaw nevertheless regarded his wife as part of himself.

Shaw began Molly's stage education by insisting that she use, not her maiden name, Mary Arthur, but a combination of the first name he had given her, Molly, and her married name, Tompkins. "It is very *memorable*," he wrote her. "Nobody else would dream of taking it." Her speech appalled the Irish-born master of the English language. He had her enroll in the Royal Academy of Dramatic Art for private elocution lessons. He instructed her on makeup and manners, posture and dress, then told her, "You are an unfinished article. You dont exist as yet." But despite his coaching, Molly's acting career lagged. She refused to endure the necessary years of artistic drudgery, and after a clash with Claude Rains, her instructor at RADA, she left the school and obtained a few roles by charming some theatrical managers. The Shakespearean actor Sir Johnston Forbes-Robertson, by then retired, was captivated by "the exquisite young thing." Under his and Shaw's direction, Molly might have become an important actress. Instead she regarded both men as amorous conquests.

Eager to act in a Shaw play, Molly begged for the role of Eliza in *Pygmalion*. Shaw informed her that she was five years away from being ready. When she had appeared in a student production of his comedy *Fanny's First Play*, he told her brutally, "You looked like Marie Antoinette in the Conciergerie about to be told of the death of her children." Clearly she was not cut out for comedy.

Suddenly Molly announced she was tired of the theater and had tried acting only to please Laurence. All she wanted was "to live"—and preferably elsewhere. Her decision was due to her growing disappointment, not just with the stage, but with Shaw, because her fierce longing for possession was meeting with a typical Shavian response. For Shaw was a master at rousing passions that he did not intend to satisfy. He was once derided as "loving women this side of adultery."

Arline B. Tehan is working on a book about the final years of Bernard Shaw and Auguste Rodin.

GM Let's get it together... buckle up.
© 1990 GM Corp. All rights reserved.

Sure, it's possible to find another car this unique. It's also possible Halley's comet will return tomorrow.

The odds of another carmaker coming up with a car like the new Toronado Troféo® are, well, astronomical.

That's because the 1991 Troféo's uncommon luxury is light years ahead of ordinary luxury coupes.

For starters, there's a state-of-the-art visual information center available that's capable of storing and recalling up to 51 useful, full-color displays.

Other standard features include a responsive 3800 V6 engine with tuned port injection, a touring suspension system, anti-lock brakes, a driver-side air bag that supplements the safety belt, power adjustable front bucket seats and remote lock controls.

The new Troféo is also protected by a truly unique feature. The *Oldsmobile Edge*—the most comprehensive owner satisfaction program in the industry.

Visit your Oldsmobile® dealer today. Or call toll-free 1-800-242-OLDS, Monday—Friday, 9 a.m.—7 p.m. EST.

You'll see that, unlike Halley's comet, the new Troféo is one phenomenon you can experience every day.

Toronado

The New Generation of Oldsmobile™

Rolling Ball
SELECTIP®

Cross has elevated the form and function of rolling ball writing to the pinnacle of accomplishment. A distinctive gift, the Cross Rolling Ball Selectip® features a wide body design that also accommodates Cross porous-point refills.

Available in new 18 karat gold filled, shown, and a range of other case qualities. Priced from $25 to $100. Unquestioned lifetime mechanical guarantee.

Alternately enticing, then resisting Molly, he laughed when she called him a Don Juan, then wrote, "Is it not delightful to be in love? You will find it described in *Heartbreak House* as far as it can be described. It has happened to me twice. It does not last, because it does not belong to this earth; and when you clasp the idol it turns out to be a rag doll like yourself; for the immortal part *must* elude you if you grab at it."

So she departed for Italy—restless, temperamental Molly, who wanted only "to live," accompanied by the faithful Laurence and Peter, now 5. Shaw deplored their "wandering about Italy like lost dogs." Replying to her vivid account of her affair with an Italian follower, he wrote sharply, "I dont suppose she [the wronged wife] will shoot you, but if she does, no Latin jury will convict her any more than they would Laurence if he gave you the thrashing you deserve." But in Molly's love affairs Shaw saw an unpleasant reflection of himself, and he added, "I am very nearly as bad as you."

To her repeated pleading for "consummation" Shaw replied, "Your romance has lasted a long time without spoiling. There are moments, of course, when you want to consummate it. But they pass; and the romance remains. You are tired of waiting; but suppose there were no longer anything to wait for!" As if to suggest the innocence of their relations, he continued, "Your letters are extremely readable (my wife is quite keen on them) and they make me feel romantic at times, which is pleasant at my age. After all, I shall not be completely seventy until July."

Molly had taken a house on a little island in Lake Maggiore, offshore from Pallanza. The Shaws came to visit, staying at a hotel in nearby Stresa, a short boat ride from "Isola Molli," with Molly staying in Baveno, two miles away, until the house was ready. As the summer idyll began, roles were reversed. The Great Man, whom Molly had pursued so eagerly, was now following her, but at a measured pace. Molly resented the constant presence of Charlotte, who was unfailingly polite but never taken in. Once, Shaw spotted on the balustrade outside their hotel suite a pair of high-powered binoculars with which Charlotte had been observing him and Molly across the lake.

Molly resented Charlotte's reverential treatment of her husband, always

Among Shaw's earlier romantic interests was the actress Ellen Terry.

Mrs. Patrick Campbell, another G.B.S. love, played Eliza in his *Pygmalion*.

Give the gift of good health this holiday season...NordicTrack.

*NordicTrack offers fitness machines for every lifestyle.**

Give the gift that will last a lifetime.

Good health. There's no question about it. To enjoy life to the fullest, you need to keep your body, mind and spirit strong. And the best way to do that, is by establishing a regular fitness program.

That's why the most meaningful gift you can give this year is the gift of fitness from NordicTrack. It's the perfect gift for yourself or your loved ones. NordicTrack enables you to feel, look and be the best you can be.

NordicTrack is a gift that keeps on giving.

You'll see and feel the benefits of a NordicTrack exercise machine for years to come.

Achieve better health through weight loss, reducing risk of heart disease, hypertension and osteoporosis. NordicTrack workouts also reduce stress, and lead to vital health and a general youthful feeling that come from a strong heart and total-body fitness.

Discover how NordicTrack can change your life forever.

NordicTrack® A CML Company

Send for FREE VIDEO & Brochure!

1-800-328-5888 Ext. 355K0

❑ Please send me a free brochure for:
_____(product name)
❑ Also a free video tape ❑VHS ❑BETA
❑ Send me the free *NordicTrack "Fitness At Home"* catalog.
Name _____
Street _____
City_____State_____Zip _____
Phone ( ) _____
141C Jonathan Blvd. N., Chaska, MN 55318

**Our original NordicTrack® is considered the world's best aerobic exerciser. NordicRow TBX™ gives you twice the workout of ordinary exercise machines. NordicPower™ is a new strength trainer that helps you look, feel and be the best you can be. Nordic Fitness Chair™ gives you a health club workout at home.*

Give a Gift of Royal Gold

An authentic gold treasure of the Romanovs

The 1897-1911 "Czar Nicholas II" Gold Coin Pendant

The famous opulent jewelry of the Romanovs reached a highpoint in the reign of Nicholas II, the last Czar of Imperial Russia. The Czar himself often presented gold jewelry, engraved with his portrait and the imperial crest, to favored members of his court. Now you can give someone special an exquisite original gold 5 Roubles coin of Nicholas II, transformed into a dazzling pendant with a custom-made 14-karat gold bezel and 18-inch 14-karat gold chain. Struck at the Imperial Mint at St. Petersburg, each .900 fine gold coin displays superb minting artistry. The Czar's portrait appears on the obverse and the double-headed eagle of the imperial crest on the amazingly intricate reverse.

enlarged to show detail

After the 1917 Revolution, only a tiny fraction of these exquisite gold coins escaped destruction and found their way to the West. Today they are elegant remnants of the golden sunset of the Romanovs. Each scarce gold coin weighs 4.3 grams and comes in guaranteed Extra Fine quality — retaining virtually all of the original intricate detailing.

Pendants include a presentation case and certificate of authenticity. While supplies last, the price is **just $395 postpaid. Order #14233. To order by credit card, call toll-free 1-800-451-4463 anytime.** Or send a check or money order to: International Coins & Currency, Inc., 11 E. State St., Box 218, **Dept. 1745**, Montpelier, Vermont 05601. Money-back guarantee — 30-day home examination.

Shaw was close to his wife Charlotte even though they eschewed sex.

addressing him as "G.B.S.," never letting anyone forget his greatness. To Molly he was "B," and she was his "Mollissima." Gradually her expectancy turned to moodiness, irritability and rudeness. At a fancied slight from Shaw, she fled, leaving him a note, "Returning to Paris immediately." The usually self-controlled Shaw exploded: "What do you mean by it, you young devil? 'Am returning immediately to Paris'. Return immediately to hell, you little beast, and never dare write to me or mention your poisonous island to me again as long as you live." The letter was signed with a huge, angry "G B S." Next day he wrote more calmly, but warningly, "You are behaving like an idiot. Come to us sensibly on Tuesday, . . . clothed and in your right mind."

Shaw must have seen that this romantic trio could have stepped straight out of one of his own comedies. To lighten the tension between Molly and Charlotte, he advised Molly, "Stop being so polite to each other. The strain is terrible. Can't you tell her to go to hell, once? You'd both feel better afterwards." At Molly's reply, "But I couldn't. She is much too old," Shaw winced, and she remembered that he and Charlotte were the same age. "But to me," she reflected later, "he was so full of gaiety and vitality he had no age."

In 1927, the second summer of their idyll, Shaw and Molly rested one day beneath the trees on a riverbank. Suddenly Shaw suggested that she write his biography. Molly listened to his "curiously enchanting voice" discourse mostly about women. When he stopped, Molly stretched and sighed, "I'm so full of you and the river and the trees and sweetness, but still I couldn't write your life. I would make a fool of you and of myself."

Molly loved picnics; Charlotte detested them. Shaw relished the chance to display his prowess at swimming and diving. While the lively pair disported in the water, Charlotte would sit on shore, rigidly upright, in a bathing suit of black taffeta with a stuffed canary at the shoulder, at which

Molly was the model for a J. M. Flagg poster shortly before meeting Shaw.

Witness the pageantry of China's Forbidden City

"The Emperor's Wedding" Music Box

Shown actual size of
4⅝" long, 2½" wide, 2⅞" high

Never before in music boxes has the splendor of imperial China been revealed to the western world.

Presenting "The Emperor's Wedding" music box. By master artist Sheng Fu. With music by composer Wei-Tsu Fan.

Journey back to an age forever lost in time... to China's Forbidden City. Hold this music box in your hands—the *first* music box created in the shape of The Hall of Supreme Harmony. Observe an imperial wedding...each tiny detail captured by Sheng Fu in delicate, translucent watercolors...and re-created on pure porcelain.

Remove the lid and turn the key...and enjoy *The Suite for the Forbidden City, Movement #1: 'Double Happiness.'* An original musical score composed exclusively for this music box.

"The Emperor's Wedding." An investment-quality music box for the discriminating collector. Crafted in a limited edition of 84 firing days. Exclusively authorized by The Palace Museum, Beijing.

Available exclusively through Ardleigh Elliott & Sons. $39.50.

Trademark "Forbidden City" is under license from The Palace Museum, Beijing, China.

ARDLEIGH ELLIOTT & SONS
M·E·R·C·H·A·N·T A·P·P·R·A·I·S·E·R·S
CHICAGO • ZURICH • LONDON

Reservation Request

Please respond by November 30, 1990

Ardleigh Elliott & Sons
Merchant Appraisers
212 West Superior, Chicago, Illinois 60610-3533

Please enter my reservation for "The Emperor's Wedding" music box, first in *The Forbidden City Music Box Collection.* I will be notified when each subsequent music box in the collection becomes available.

I will send no money now. Bill me in two monthly installments of $19.75,* the first payable before shipment. If not delighted, I have a full 100 days to return my music box for replacement or refund.

*Plus $2.11 home delivery fee per music box.
Offer valid in the U.S. only.

(Mr.) (Mrs.)
(Ms.) (Miss)
(Please circle one) Name (Please print)

Address

City State Zip

( )
Phone

© 1990 Ardleigh Elliott & Sons AE-2801 73191-E91807

Molly found it hard to repress a grin.

When Charlotte invited Molly and Laurence to dine in Stresa, the Tompkinses set out across the lake in a canoe, but were caught in a sudden squall. When they arrived at the hotel dining room, drenched and shivering, Charlotte froze and Shaw looked dismayed. Nobody ate much dinner. Upstairs in the Shaws' sitting room, Molly was still trembling with cold, so Shaw picked her up and laid her on his bed to get warm. Holding her hand, he asked gently, "Why are you so cross, and unreasonable, Molly?" Hesitantly she informed him that she was pregnant and planned to have an abortion: "I *won't* have any more babies."

Shaw protested, "But Molly, you should have one baby after the other." She shook her head. "No, I'm going to Milano next week." "Molly," Shaw pleaded, "please don't go to Milano. It will be my spiritual child, at least." Then, "through the mist of my tears," Molly recalled, "it looked as if Shaw too were crying."

A few days later Molly and her husband returned to Stresa from Milan. Shaw was there to meet her, and as she settled onto the cushions in the boat that would carry her out to the island, she looked up at him. He was standing with his arms folded, but she noted that "his eyes were old and tired, and for the first time I saw a hint of grey in his face." "Molly, Molly," Shaw said gently. "And I felt I had committed a murder," she would recall. In her self-involvement, Molly could not see that to Bernard Shaw, who was the apostle of his own religion, the "Life Force," her action was a betrayal of the very purpose of woman.

Of this summer ordeal, Shaw later wrote to Molly, "I had really a dreadful time in Stresa. I had to preserve the dignity of Mrs Shaw and Mr Tompkins (to say nothing of my own before all the world) as well as the character of Mrs. Tompkins, who was determined to throw it all away and lead me captive. Mrs. Shaw, though resolutely kind, was naturally uneasy; Mr. Tompkins was angelic but a helpless prisoner on an island; Mrs. Tompkins was possessed by seventy and seven devils, in addition to being the very devil herself. I wonder does she feel any remorse." Molly's reply was decisive: "I felt no remorse."

In January 1928, Shaw was still Molly's reluctant captive, writing her about an "American lady who loved me, and then gave me a shock by looking at me with hatred in her eyes. . . . That wicked woman is giving me absent treatments of hatred. Perhaps she has made a wax figure of me and is sticking pins into it. Only by casting her out utterly can I escape the spell; and I find that somehow I cannot do

AT MARVIN, WE MAKE A LOT OF WINDOWS STRICTLY BY THE BOOK.

You're looking at the first bent glass Corner Window.™ And the fact that it's a Marvin window isn't all that surprising. What would have been startling is if someone else had developed it first.

See at Marvin, we don't make windows like everyone else. We make them one at a time, to your exact specifications. So the shapes, styles and sizes we offer are as limitless as your imagination. And our made-to-order philosophy also means you're free to choose the options you want when it comes to energy efficiency, maintenance-free exteriors, glazings, divided lites, even hardware.

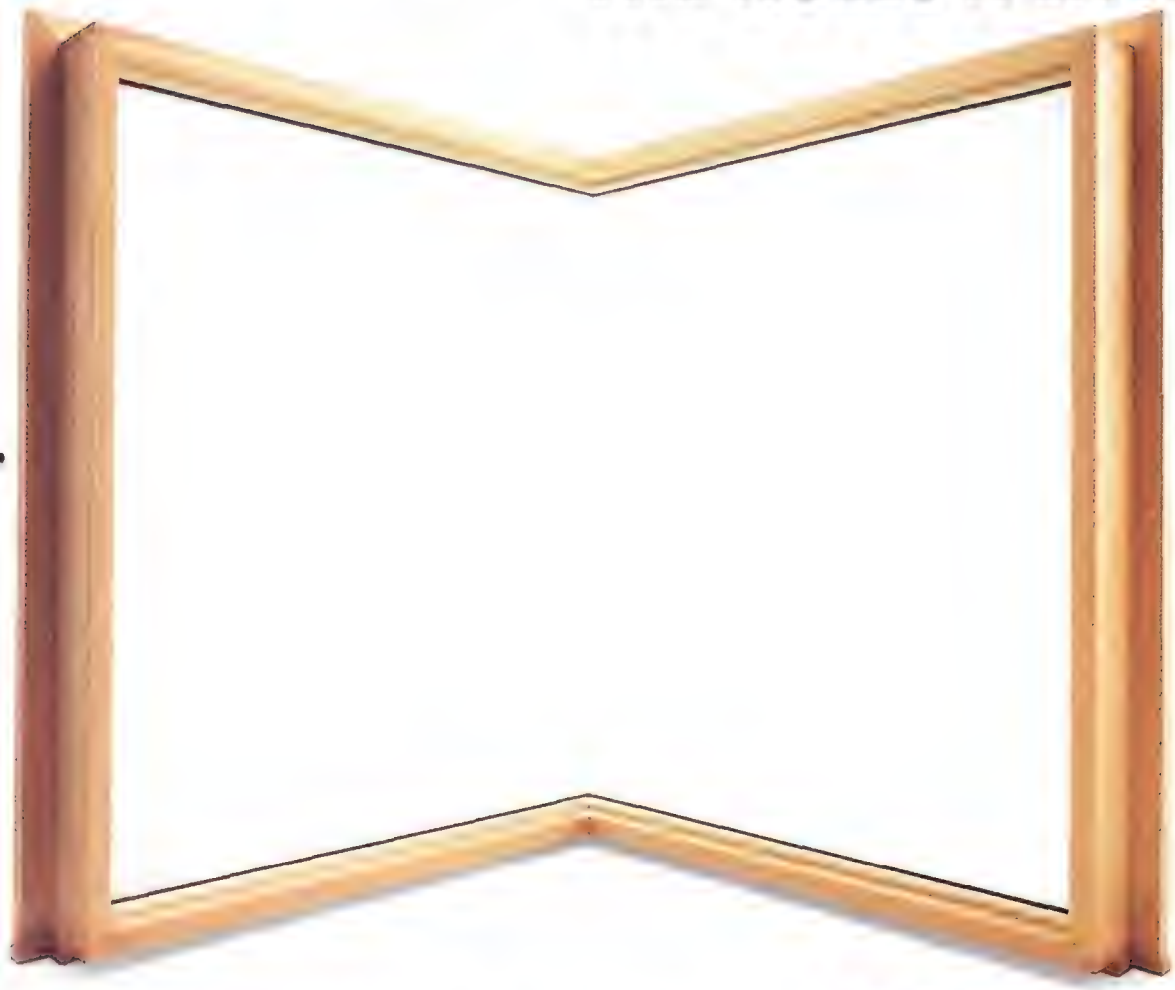
So whether you're building, remodeling or just replacing an old window, don't limit yourself to what's merely acceptable. Instead, think about what's possible. And make your first choice the windows that are known for firsts. Marvin.

Laurence Tompkins works on a bust of Somerset Maugham; Laurence's correspondence with Shaw has been lost.

that. The old tenderness gives the witch her grip, and I languish and must presently die of her hatred. Unless she relents and sends me a message of love I am a lost man, though a most innocent one. Innocent or not, her admiration was an indispensable Vitamin in my bread of life; and if I perish my blood will be upon her head."

Shaw was genuinely distressed about Molly's future. "The life you are leading is horribly wicked. You cannot keep blasting your soul without blasting your body as well; and you will perish miserable. I can do nothing. . . . You are a predestinate damned soul, a Vamp fiend, neither doing justice, loving mercy, nor walking humbly with your God. You will prowl around that lake, making men's wives miserable, tormenting yourself whenever their glances wander from you for a moment, until the lake wa-

BUT EVERY NOW AND THEN, WE LIKE TO BEND THE RULES A LITTLE.



Our free Idea Brochure shows you all the possibilities. Or get our colorful, new 64-page "Before and After" book, filled with exciting remodeling ideas. Send this coupon and your check for $4.95 to: Marvin Windows, Warroad, MN 56763. For more information or to order using MasterCard® or VISA,® call **1-800-346-5128.** In Canada, 1-800-263-6161.

Name _____

Address _____

City _____ State _____

Zip _____ Phone _____

I'm in the: Build ___ Remodel ___ Replace ___ SM-0020-10

Please send me:

___ Free Idea Brochure

___ 64-page Before and After Book ($4.95)

MADE TO ORDER **MARVIN WINDOWS**

Complete 2-Year Set of SHORTEST U.S. DOLLAR SERIES SINCE 1795!

The only Dollar series with a shorter life than the Susan B. Anthony Dollar was the 1794-95 Flowing Hair — America's 1st Dollar! The Anthony Dollar was released into general circulation for only two years — 1979 & '80. (In 1981 they were available only in Mint Sets.)

With this special offer you get all 6 regular issue Susan B. Anthony Dollars for only $10! One mint Uncirculated coin from each of the 3 Mints (Philadelphia, San Francisco, Denver) which struck them in both years (1979 & '80) — a $21.75 regular retail value!

Ridiculed by the public as the "Carter Quarter" the mini-dollar is fast becoming *a prized collectible.* Hard to put together now, a Complete 2-Year Set will get even harder. Clip the coupon below and send today! You'll also receive our fully illustrated catalog (mailed separately), plus other offers on approval. Satisfaction guaranteed or your money back. DON'T DELAY (limit 4 sets). © LCC

Littleton Coin Company, Dept. LSS173, 253 Union St., Littleton, NH 03561

Serving Collectors Nationwide Since 1945

Send coupon with payment to:
Littleton Coin Company,
Dept. LSS173, Littleton, NH 03561
(6 coins: 1979 PDS & 1980 PDS) .$10.00

_____how many (limit 4 sets)

$_____Total enclosed

Mr/Mrs/Ms _____

Address _____

City _____

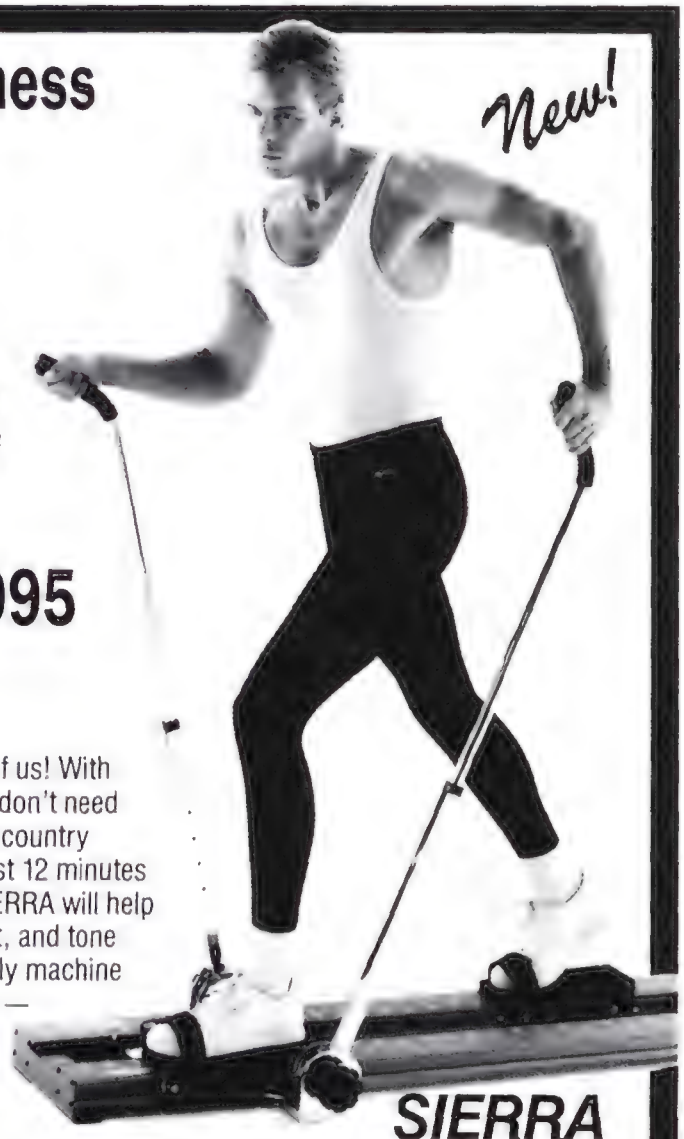
State/Zip _____

Full 45-Day Money-Back Guarantee of Satisfaction

ter changes to fire and brimstone and scorches you into nothingness. What will become of you? How will you face old age: With a 'lifted' face, with grease paints and an iceball and rouge, with peroxided hair, an old hag desperately pretending to be a young witch? Oh, Molly, Molly, Molly, Molly, I must not think about you; for I cannot save you; I have done my best and only made matters worse."

But he could not forget her probable fate, so he begged her, "Cannot you learn how to live in the world? You are not a thing of evil in itself; and it is impossible to believe that you *must* go to the devil by natural necessity, though my experience tells me that you will. For Mephistopheles whispers to me as he did to Faust 'She is not the first.' Before you were born I had to do with sirens as seductive as you. And now! You will go their way unless you can relegate love affairs to very occasional distractions. . . . You thought that when you secured your Ogygia and lured me to its shores, you could play Calypso to my Odysseus and make a hog of me. Aren't you glad you didn't succeed: After all, you have some brains in your upper half.

Now...Lasting Fitness Begins with This Simple Exercise:



Dial 1-800-328-8995

For a Free Brochure on the New *SIERRA*

Now there's a ski exerciser for the rest of us! With the new SIERRA by Fitness Master, you don't need the balance and coordination of a cross-country athlete to reach your fitness goals. In just 12 minutes a day, three to five times a week, the SIERRA will help you shed pounds, strengthen your heart, and tone muscles, too. On this sturdy user-friendly machine you can burn up to 900 calories an hour — with less risk of muscle strain or injury than other forms of exercise.

Call or write today — no obligation!

Made in the USA by

Fitness Master 504 Industrial Blvd. Dept. SM, Waconia, MN 55387

SIERRA
AEROBIC CONDITIONER

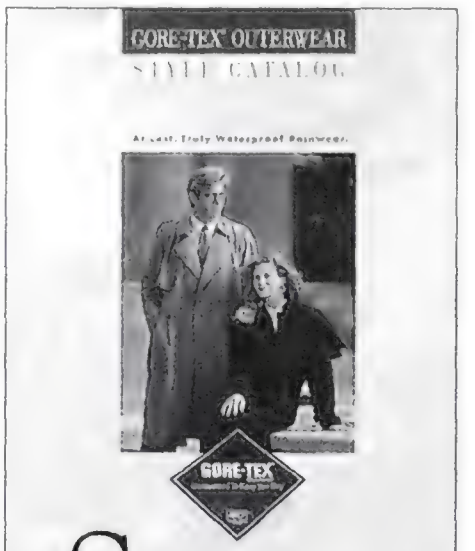
Molly's son, Peter, became a writer, published the Shaw-Tompkins letters.

An aging but fit Shaw shows off his diving form at an Italian lake.

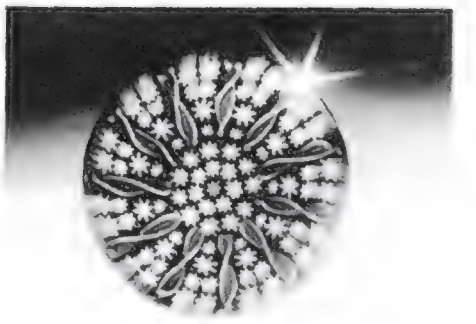
This erotic-romantic attitude to life doesn't make you happy."

The following summer, the Shaws did not revisit Molly's island, staying instead on the Italian Riviera, safely out of reach. But his torment showed in his angry note to her: "For seven weeks I have been hiding within a day's ride. . . . I shall have left when this reaches you. . . . I am not in the least angry: why should I be? But you should not drive me away to hell-paradises like the Riviera by refusing to behave yourself tactfully. In this place when you are not bathing or driving over the mountains you are stark mad with irritable despair. . . . All your fault."

In February 1929, Molly and her entourage were off to Rome. When she asked Shaw, "Are you through with me?" he replied, "At my age one is thru with everybody, and can only beg for a little charitable tolerance from young persons. I hoarded my bodily possessions so penuriously that even at seventy, I had some left; but that remnant was stolen from me on



Send today for your free Gore-Tex® Outerwear Style Catalog, featuring the latest in Gore-Tex® Rainwear.
To receive your catalog call:
1-800-843-6330
Or please write to us at:
W. L. Gore & Associates, Inc.,
100 Enterprise Place
P.O. Box 7035
Dover, DE 19903-7035



Discover the beauty of glass

PAPERWEIGHTS

Perthshire millefiori paperweight from Scotland (above). **$65**

Collectors' Paperweights — Price Guide and Catalogue. 192 pages, full color. **$15** (Free with purchase of the Perthshire paperweight.)

Our latest color brochures. **$2**

L. H. Selman Ltd.
761 Chestnut Street, Suite 9J
Santa Cruz, CA 95060
Toll-free 800 538-0766

Name
Address
City State Zip
Check enclosed ☐ MC ☐ VISA
California residents add appropriate sales tax
Card number Exp. date

Free information about getting started in model railroading with Märklin.

Christmas morning, 1955. The light is still dim. But already your heart is racing. Finally, the time comes. Sure enough, there under the tree, surrounding the other gifts—a shiny new train set . . .

Märklin hasn't lost the fascination. We recapture it in every model we make. Including the elegant "Rhinegold" (HO Gauge shown here). Since 1891, old-world craftsmanship and technical innovation have made Märklin the most respected name in HO, Z, and 1-Gauge model railroading. Our commitment to excellence ensures that the tradition of model railroading will be passed along from generation to generation.

Now's the perfect time to reacquaint yourself with an old love. To get started in model railroading with Märklin, call us at 1-800-825-0888 or send in the coupon below.

märklin®
The World Leader in Model Railroading.

☐ **Yes!** Send me free information on model railroading with Märklin.
NAME
ADDRESS
CITY STATE ZIP
SEND TO Märklin Trains P.O. Box 249 Thiensville, WI 53092
SM-1190

Rent Mother Nature®

Lease a Sugar Maple Tree or Sap Bucket for One Year

A truly memorable gift

First, we'll send each of your gift recipients a copy of an authentic 1890 Treasury Department "**License for Sugar Producer**" hand - personalized and suitable for framing, plus a gift card from you. During harvesting each lessee receives 3 **Progress Reports** full of facts and folklore thus sharing the adventure of sugaring on a farm where trees have been tapped for over 85 years! They'll almost be able to smell the sweet smoke of the wood-fired arch beneath the boiling pans and experience the romance of horse-drawn sap sleds working their way to the sugar house. Then, in Spring of '91, when all the sap has been processed, each Tree Tenant will get **at least 50 ounces of the finest 100% pure Maple Syrup** in decorated jugs (25 oz. guarantee to Bucket Borrowers) and even more if Mother Nature is bountiful. Your thoughtfulness and originality will be expressed 1, 2, 3 times...and more each time the syrup is savored. We do all the work, your friends get the delicious results, and you get all the raves!

100% SATISFACTION MONEY BACK GUARANTEE

Tree Lease $39.95 OR Bucket Lease $29.95
Send check with name & address of each recipient.
Price includes shipping in 48 states.

RENT MOTHER NATURE®, Dept. 112
52 New St., Box 193, Cambridge, MA 02238
To Order by Phone call (617) 354-5430 VISA, MC, AMEX

1990, North Country Corp.
All Rights Reserved

the road to Baveno and on other roads to paradise through the same district. Now they are all dusty highways on which I am safe because nobody can rob a beggar. Nothing is left, except my eternal genius."

In Rome, Molly was caught up in a frantic social round, but she couldn't forget Shaw's warning, "You are a predestinate damned soul." Impulsively, she took an overdose of the sedative veronal in an attempted suicide. She was rescued by Laurence, who explained to others that she had been poisoned by mushrooms, then took her back to the island.

Shaw's response was mocking. "You really *are* a duffer—couldnt even poison yourself properly! . . . What you need, too attractive one, is a job in a factory without anything but your wages to live on; all the better if you had to support the boy. . . ."

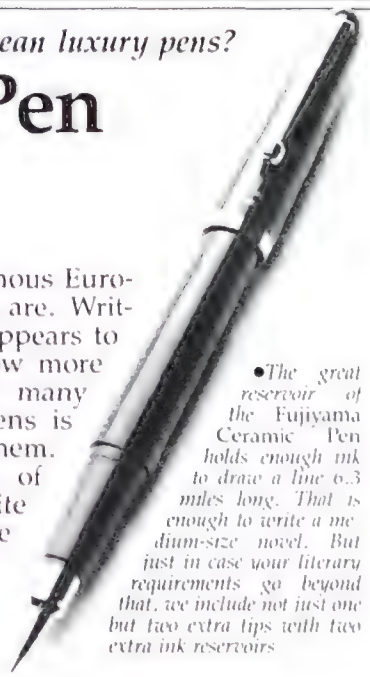
To distract Molly, Laurence fitted up a studio for her and hired models so that she could paint nudes. Still concerned for her emotional stability, he arranged for a consultation with the analyst Carl Jung, at which Shaw wrote, "Give him [Jung] these notes: 'Mary Tompkins. Young American savage. Found on attaining adolescence that she attracted men irresist-

Does this Japanese model outperform famous European luxury pens?

Fujiyama Ceramic Pen only $39.95*

But read this ad for an even better deal!

If you've ever had occasion to write with one of the famous European pens, you know what marvelous products they are. Writing with them is a joy. It is almost effortless. The pen appears to float across the paper—even your thoughts seem to flow more freely. The substantial drawback, however, as with so many other nice things, is that the price of these luxury pens is awfully high. It's easy to spend $150 or more on one of them. Our Japanese friends have created their own version of these luxury pens. They are equally pleasing and quite similar in appearance, heft and feel. They have the same hi-lacquer finish, the same fine gold-tone accents and the same gold-plated clip as the famous European luxury pens. The exclusive ceramic writing tip provides silk-smooth, effortless writing. It will never flatten, stall or skip, even after hardest and longest use.



•The great reservoir of the Fujiyama Ceramic Pen holds enough ink to draw a line 0.3 miles long. That is enough to write a medium-size novel. But just in case your literary requirements go beyond that, we include not just one but two extra tips with two extra ink reservoirs

The most remarkable thing about the *Fujiyama Ceramic Pen* is its price. We are the exclusive distributors and are therefore able to offer it for just $39.95. But, we have an even better deal: ***Buy two for $79.90, and we'll send you a third one, with our compliments—absolutely FREE!*** Discard those tacky ballpoint pens and those clumsy felt tips. Write smoothly and easily, give character and good appearance to your writing. And make a really great buy, an even greater one if you take advantage of our "3-for-2 better deal". Get with it—get your *Fujiyama Ceramic Pen(s)* today!

FOR FASTEST SERVICE, ORDER
TOLL FREE (800) 882-3050
24 hours a day, 7 days a week

Please give order **Code #4800A560**. If you prefer, mail check or card authorization and expiration. We need daytime phone # for all orders and issuing bank for charge orders. Add shipping/insurance: $4.95 for one; $6.95 for three. Add sales tax for CA delivery. You have 30-day return and one-year warranty. We do not refund shipping charges.

For quantity orders (100+), call Ernest Gerard, our Wholesale/Premium Manager at (415) 543-6570 or write him at the address below.

since 1967
haverhills®
131 Townsend Street, San Francisco, CA 94107

Molly welcomes Shaw to an exhibit of her paintings in London in 1931.

At her one-woman exhibition at London's Leicester Galleries, Molly positions a canvas; she sold 14 paintings at the show.

ibly. . . . All the symptoms pretty bad; ungovernable, cruel, unscrupulous, unmusical, spendthrift, bad mother, ruinous wife, so accustomed to adulation that she mistakes her crudest daubs for Monet masterpieces and Goya triumphs. Sole redeeming feature an interest in old Shaw difficult to reconcile with her general depravity, but probably a relic of inherited good taste."

When Molly scheduled an exhibition of her paintings in the Leicester Galleries in London (above), the Shaws arrived to watch as the canvases were uncrated. Afterward, they gave her lunch in their Whitehall Court apartment. Molly, an avid reader of D. H. Lawrence's novels, spotted a book of his drawings that someone had given Shaw. Sitting together on the sofa, with Molly in the middle, they inspected it. As they turned a page, Charlotte suddenly gasped, "Good Lord, Molly, what is that?" Molly replied, "Oh, just some men." "Dear, dear," asked Charlotte, "whatever are they doing?" "Well, sort of playing about," said Molly. "Nonsense," retorted Shaw. "It's an orgy of homosexuality. Let me have a good look." Later, Molly recalled, "There they sat . . . Shaw an ancient saint, Charlotte very mid-Victorian, leafing through the book, as amazed as children."

In his letters during the 1930s, Shaw reminded her of his age. "You see, bellissima, you and Laurence will still be in the prime of life twenty years hence. There is a horrible possibility that I may be—I will not say what you would call alive—but above ground. Even in ten years I shall be 85, a doddering whistling anecdote repeating old bore. Therefore love me as long as you can; but make young friends." He continued to write, offering advice and even funds for Peter's schooling, insisting, "One of the first arts of life is to have no delicacy about money." Although the Tompkinses were divorced in 1934, they remained friends, with Shaw advising a reconciliation.

After Charlotte died in 1943, at age 87, Shaw wrote Molly, "I am a vecchio, nearly eightyeight and a half. I am also a widower." He conceded that he had received some offers of marriage, "as I am rather a catch now, having

Now You Can See St. Basil's Cathedral Without Standing In Line.

St. Basil's Cathedral, located on Moscow's Red Square, was built by Ivan the Terrible in the year 1550. The Cathedral's gold-plated, onion cupolas are some of the finest examples of Muscovite architecture in existence.

A structure as significant as St. Basil's, as you'd expect, is visited by millions every year. Of course, if you'd like to avoid the crowds, but still want to see this magnificent Cathedral, all you have to do is place an order for one of th items below. Each piece has a realistic rendition of St. Basil's. And all of them are a lot less expensive than a plane ticket to Moscow.

St. Basil's Pullover Crew
Our St. Basil's Sweatshirts are a heavyweight blended fabric. Imported & Made in the U.S. Four Colors: Plum, Jade, White, Ash. Sizes: M(38-40), L(42-44), XL(46) #1003 $34.00

St. Basil's Hooded Sweatshirt
Our St. Basil's two button placket hood with two front pockets. Oversized, super heavyweight poly/cotton fleece. Imported. One Color: Ash. Sizes: M(38-40), L(42-44), XL(46) #1004 $46.00

St. Basil's Shirts
Our St. Basil's 100% cotton washed blue chambray and white poplin shirt. Laundered for a soft worn feeling. Imported. Two Sizes: M(38-40), L(42-44). Oversized. Chambray #1005 $34.00, Poplin #1006 $34.00

St. Basil's Totebag
Our own 100% cotton canvas tote bag. Size: 13" x 14" x 6" Color: Natural. #3400 $15.00

St. Basil's Ceramic Mugs
Our own ceramic mug boxed in a set of two. High fire decal in an ivory color. Set of Two (2) mugs. #6679 $18.00 (set)

St. Basil's Pin & Key Chain set
Our own St. Basil's Pin and Keychain of cloisoinne. Packaged as a set. #6680 $8.00 (set).

St. Basil's Charm
Our own St. Basil's Charm made from 24K gold plated on sterling silver. Actual Size. 3/4" High. #4479 $18.00. Also available in solid 14K gold. #4480 $195.00

Fax Orders 1-206-628-0559
Phone Orders 1-800-676-4448

Shipping & Handling $4.75 per order

We're open 7 days a week, we ship all in-stock items within 48 hours of receipt and your satisfaction is 100% assured What's more, if you aren't entirely happy we'll arrange and pay for your UPS return.

WorldWide Exhibitions
INSPIRATIONS SOUVENIRS COLLECTIBLES

Selected items available in the Moscow: Treasures & Traditions Museum Shop in the International Center. Smithsonian Institution, Washington D.C. Phone 202-786-2147.

only a few years at most to live and my widow would be well provided for." Then he added, "We can write more freely now that Charlotte can never read our letters. I could never bring myself to write a line that could hurt her; but now I can write *anything*."

Molly's reply in October 1945 was, in Shaw's words, "an atomic bomb." She wrote that she was planning to come and live with him. The 89-year-old Shaw was appalled, resembling his ancient Shotover when confronted with young Ellie, who insisted, "I should like to marry a very old, very rich man. I should like to marry you." Like the old sea captain, Shaw clung to his freedom as to a spar in a shipwreck. By return post he wrote in controlled fury, "Put [the idea] out of your very inconsiderate head at once and forever. . . . No woman shall ever live with me again in that sense.

"I am a Great Man," he continued, "living in dignified retirement in a village in a house which I have given to the National Trust as a memorial to my life here with Charlotte and my death in a solitude which let nobody dare to profane." He warned her that his stern Scottish housekeeper and his Irish Catholic housemaid would leave instantly if she came. "The scandal in the village, the degradation to Literature, the insult to Charlotte's memory would be such that I would be justified in shooting you if there [were] no other way of preventing you from crashing my gates. . . . Why have you not known all this without my having to tell you? You are no longer a young savage: you are a mature woman. If you ever think of old men of ninety, you must realize that they do not wish to be made ridiculous, much less disgraced before the world." Shaw's letter concluded, "No more atomic bombs, please."

Lest the letter fail to reach her in time, he sent a cable, forbidding her to come. Molly's reply allowed her the last word. Writing from her New York apartment, she raged, "What a monstrous way to misconstrue my letter! Come and live with you indeed! Do you think I would give up the serenity of my independence to live with anybody on earth—and be responsible to them for my time and my thoughts—even you? Hell, no!"

The year before his death, Shaw sent a note and photograph to Molly. The note tells all: tumultuous though it was, the affair between G.B.S. and Molly Tompkins endured.

The Old Man at his gate
As he was in forty-eight
And still is at ninety three
Awaiting news of thee

Molly Brown

1965. Ayot Saint Lawrence
3 January 1949

Radio Shack Introduces: The Revolutionary Encyclopedia that Brings Learning to Life

Compton's MultiMedia Encyclopedia™
and the Tandy 2500 XL
with CD-ROM Drive

The world's first illustrated, animated and sound-enhanced encyclopedia is here. Using the PC-compatible Tandy 2500 XL with built-in CD-ROM drive, a world of information is now available at the touch of a button.

The all-new work contains the *entire text* of the 26-volume Compton's Encyclopedia, plus 15,000 illustrations, 45 animated sequences and 60 minutes of sound all in one compact disc.

No other encyclopedia lets you watch a beating heart or an erupting volcano come to life on your computer screen. You can spin the globe and travel the world with a point and click.

Using eight Entry Paths, it's easy to select information in a way that best suits your needs or preferences. The Merriam-Webster Intermediate Dictionary is online and glossary words are actually pronounced.

Combine all this with a Tandy 2500 XL. This powerful 80286-based system features a built-in CD-ROM drive, 1MB RAM expandable to 16MB and comes with MS-DOS® and the DeskMate Graphical User Interface® built into memory.

Discover a world of knowledge. Come into your nearby Radio Shack Computer Center today for a complete demonstration. Or call operator 87-C1 at 1-800-433-5682 for more information and the Computer Center location nearest you.

Radio Shack®
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

Compton's MultiMedia Encyclopedia/TM Encyclopaedia Britannica, Inc., Patent Pending. MS-DOS/Reg. TM Microsoft Corp.

How Many Ways Can You Arrange Pontiac Trans Sport's Modular Seats?

GM® Call Toll-Free 1-800-762-4900 For More Product Information

BUMPER TO BUMPER PLUS
3 YEAR/50,000 MILE WARRANTY

LET'S GET IT TOGETHER... BUCKLE UP. ©1990 GM CORP. ALL RIGHTS RESERVED. SEE YOUR DEALER FOR TERMS OF THE LIMITED WARRANTY

Good Question.

You had to ask. Actually, considering how easily Trans Sport's modular seats carry up to seven people*, flip forward out of the way, fold down flat for cargo, or can be easily, quickly removed and reconfigured...the possibilities could be endless.

Of course, Trans Sport is more than just amazingly versatile. Its aerodynamic, wind-cheating shape is dramatically different. Its fuel-injected 3.1L V6 and front-wheel drive with power rack-and-pinion steering make it fun to drive. Plus its incredibly strong space frame is girded with special composite lower body panels. So Trans Sport stands up to minor dents and dings with ease and will never rust.

When it comes to quality, versatility and excitement, Trans Sport® is unquestionably the Pontiac of minivans. And after seeing everything Trans Sport can do, the real question is, why would you want anything else?

*Optional seating on SE model shown.

PONTIAC® *We Build Excitement*®

SEE THE CHARACTER IN THIS OLD BARN?

The sharpest detail ever achieved in color print film. Kodak Ektar 35mm film for the advanced photographer.
Also available in 125 & 1000 ISO.
The genius is in the details.™

EKTAR SEES.
In this 2400% blowup.

© Eastman Kodak Company, 1990

Worker adjusts jury-rigged apparatus for extracting penicillin at Oxford after drug's power was recognized.

By Edwin Kiester jr.

A curiosity turned into the first silver bullet against death

For years, doctors had believed anything that would kill infectious bacteria would kill the patient, too. Then they tried penicillin

In a photograph of Fleming's petri dish, the white spots around the bottom half are bacterial colonies. Substance exuded from mold (blob at top) has killed the colonies near it. Thus penicillin was discovered.

She had been gravely ill for nearly a month when the package arrived. Anne Miller, now a vigorous 82-year-old grandmother, remembers only dimly the fight to save her life half a century ago. Drifting in and out of consciousness, half delirious, her fever spiking above 106 degrees, the young wife of a Yale University administrator heard little of the whispered, worried conferences at her bedside as a streptococcal infection raged through her body. In vain, doctors at New Haven Hospital had tried every weapon of 1940s medical science—sulfa drugs, blood transfusions, surgery—then watched helplessly as each effort failed and the young woman went steadily downhill.

Now, on March 14, 1942, they were down to their last desperate resort. They had obtained a tiny amount of a new, unknown drug developed in England that had never been used on an American patient before. The result would be an epochal event, a triumph of English and American scientific skill, dedication and luck that would transform the face of world health. But Anne Miller, the central figure in the drama, was unaware of it. All she knew about the new drug was that it came in a brown bottle in a brown bag. She remembers having smelled the faint odor of mustard seconds after receiving the first injection. The drug had an unfamiliar name. It was called penicillin.

Fifty years after the first wonder drug burst on the world, the details are still vivid in the memories of the now 70- and 80-year-olds who participated in those

ALASKA

No One Gives You More Than Regency.

Come aboard the Regent Sea or Regent Star for a seven day cruise of a lifetime! Sail between Anchorage and Vancouver...all the way across the Gulf of Alaska. Visit such exciting ports as Ketchikan, Juneau, Skagway, and Sitka. Plus you'll also sail the Inside Passage and Glacier Route as you cruise alongside majestic snow-capped mountains...past the icy glaciers...and more.

You'll dine on Regency's fine continental cuisine prepared by our French master chefs, enjoy our gracious European service and spacious staterooms. But that's not all. We also offer cruise/tour packages from 10 to 14 days at prices too good to miss. And, if you book 90 days before sailing, you can save up to $500 per cabin. With these savings you can cruise for as little as $935 per person. Money saving air add-ons are available.

It's easy to see why no one gives you more Alaska than Regency.

FOR RESERVATIONS
CALL YOUR TRAVEL AGENT
OR REGENCY CRUISES
AT 212-972-4499.

Ships' registry: Bahamas

Please send me your 1991 brochure.

Name_____

Address_____

City_____

State_____ Zip_____

SEND TO: REGENCY CRUISES
260 MADISON AVENUE
NEW YORK, NEW YORK 10016

SM 11/90

REGENCY CRUISES

James Kent (left) and Howard Florey inject penicillin into a lab mouse.

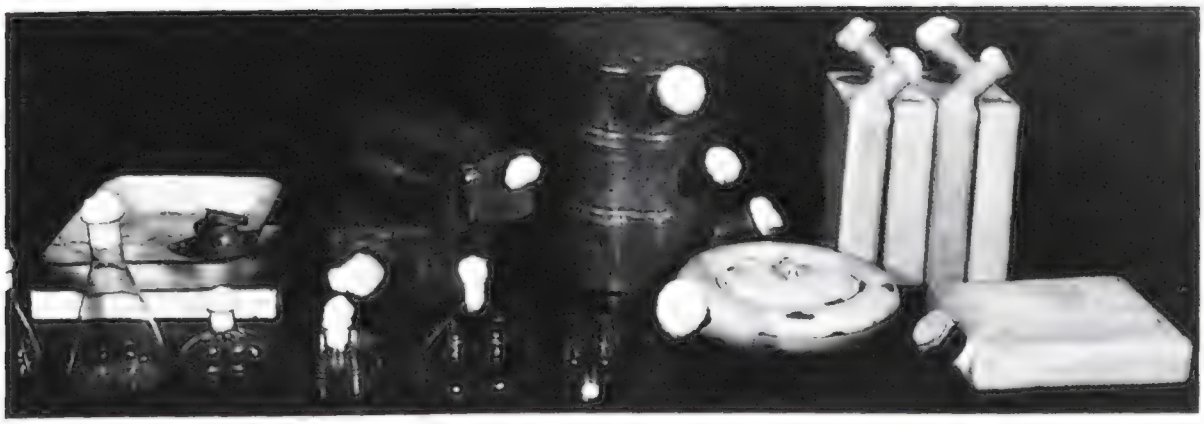
heady days. But even for them, it is difficult to hark back to an era when infections like Anne Miller's were a major threat to human health, and blood poisoning was the horror of every household. In the early 1940s, such "germs" as streptococci, staphylococci and pneumococci laid low rich and poor alike. Battle casualties succumbed more often to infection than to bullets. Bacterial illnesses were a leading cause of death. Every hospital had its isolation, or septic, ward where patients with contagious diseases or draining infections were shut up for weeks or months until the infection subsided—or won.

Yet conventional medical wisdom had held firmly for years that drugs given internally would never defeat infection—not, at least, without killing the patient. "The best minds," recalls Sir Edward Abraham, a penicillin pioneer, "believed that antibacterials would not work because they would be toxic to healthy tissue."

True, the German scientist Paul Ehrlich, after 605 failures, had finally formulated an arsenic compound named Salvarsan that specifically targeted the syphilis organism and overwhelmed it, albeit sometimes with damage to the patient. And in the mid-'30s Gerhard Domagk, another German scientist, had found that the red dye Prontosil would cure mice of certain streptococcal infections. His discovery led to the development of the sulfa drugs, which did kill certain germs, but which also had some serious side effects.

In 1928 Alexander Fleming, at St. Mary's Hospital in London—in a story that has now ascended into legend—had accidentally discovered that a mold which, he said, had blown in through his laboratory window, had killed bacteria in an open petri dish. Fleming identified the mold as *Penicillium notatum* and called the bacteria-killing substance that it produced "penicillin." His paper attracted little attention; even Fleming regarded the event mainly as a curiosity, to be demonstrated at medical meetings. The stuff was too unstable ever to be useful, he said. Other researchers saw the potential of Fleming's discovery but were defeated, too, by the chemical's instability. Then, just before World War II began, penicillin research was taken up, almost as an afterthought, at the Sir William Dunn School of Pathology at Oxford University.

Ernst B. Chain shared a Nobel Prize with Fleming and Florey in 1945.



Researchers used everything from laboratory flasks to cookie tins, rectangular cans and bedpans to culture more penicillin.

When Anne Miller lay dying in 1942, there was one man in the United States who had seen penicillin's miracles with his own eyes. Norman Heatley, today a shy, spry 79, lives in the English village of Old Marston, a few miles from Oxford University. In the spring of 1942 he was working at Merck & Company in Rahway, New Jersey. He had joined the Dunn School in 1936 as part of a research team being assembled by Howard Florey, an Australian physiologist. Another recruit was biochemist Ernst Chain, a German refugee. Florey believed that many of the answers to medical questions lay in understanding the body's chemistry, and he hoped Chain could provide them.

The team would eventually win the Nobel Prize in Physiology or Medicine, but it won no honors for harmony; the real miracle may have been that their findings could have been achieved by such a fractious staff. Sir Edward Abraham, who arrived at the Dunn School in 1940, says, "By the time Chain left, I believe I was the only one on speaking terms with him." By all accounts, Chain was brilliant, abrasive, mercurial and dogmatic."

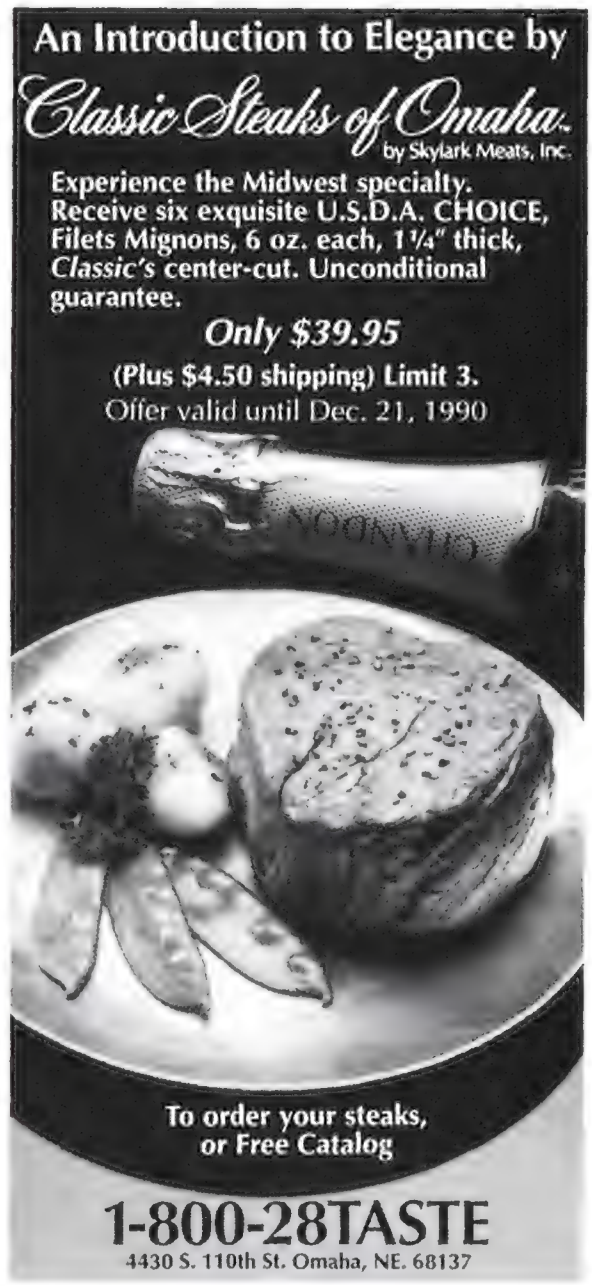
In 1939, the Dunn School was flat broke: checks were bouncing at the bank. Florey and Chain put their heads together to identify research projects that might bring funds. Before coming to Oxford, Florey had studied lysozyme, an antibacterial enzyme produced within the body, which Fleming had also discovered; Chain, after a study of snake venoms, had reviewed other naturally occurring antibacterials and in the process came across Fleming's early report on penicillin. The two men then decided to ask the British Medical Research Council and the Rockefeller Foundation for money to study the field of microbial antagonists. Penicillin was to be one among many. The projects, according to the proposals, would be pure, basic research. The proposals included a few comments, however, suggesting that the research might have future therapeutic value.

On St. Valentine's Day 1942, Anne Miller was pregnant. But only her obstetrician and two other people knew—her mother and her husband, Ogden. She already had three sons, Ogden jr., 9; David, 6; and Dwight, 4. During the previous autumn, she had nursed Dwight through a bout of strep throat, a streptococcal infection. Anne, a nurse herself, had worn a mask and gown against contagion, just as she had been taught during her training. By St. Valentine's Day, the boy seemed to have fully recovered from his protracted illness.

Whether the boy's strep-related illness led to his mother's strep infection will never be known. But sometime after midnight she awoke and knew at once she was having a miscarriage. Ogden telephoned her obstetrician,

Edwin Kiester has written on migraine headache research and on why trees are dying in Germany's Black Forest.

BIRD WATCHER'S
DIGEST
The thoughtfully perfect holiday gift for bird watching friends—or yourself!
Bird Watcher's Digest —it's the gift that keeps on giving!
Subscribe today —$15 per year-6 issues
About birds in your backyard and beyond...
BIRD WATCHER'S DIGEST
Box 110, Dept. ASM6, Marietta, OH 45750
Visa/MC call 800-879-2473
SUBSCRIBE . . . TODAY!
ASM7


An Introduction to Elegance by
Classic Steaks of Omaha
by Skylark Meats, Inc.
Experience the Midwest specialty. Receive six exquisite U.S.D.A. CHOICE, Filets Mignons, 6 oz. each, 1¼" thick, Classic's center-cut. Unconditional guarantee.
Only $39.95
(Plus $4.50 shipping) Limit 3.
Offer valid until Dec. 21, 1990
To order your steaks, or Free Catalog
1-800-28TASTE
4430 S. 110th St. Omaha, NE. 68137

The Classic Christmas Cake

Affordable... So Easy To Give

DeLuxe is DeLicious!
27% fresh, wholesome pecans.
Order now for yourself and send to family, friends and associates worldwide.
SAFE AND SOUND DELIVERY GUARANTEED!

Prices Include U.S.A. Delivery

Regular Size (1⅞ lbs.) $11.85
Medium Size (2⅞ lbs.) $17.20
Large Size (4⅞ lbs.) $28.20

CREDIT CARDS TOLL-FREE **1-800-525-1008 Ext. 524**

FREE BROCHURE WITH ORDER • MONEY-BACK GUARANTEE

Name _____

Address _____ Apt _____

City _____ State _____ Zip _____

Ship to: ☐ me above ☐ attached gift list
(Please give arrival date & size for each cake.)

Checks & All Major Credit Cards Accepted

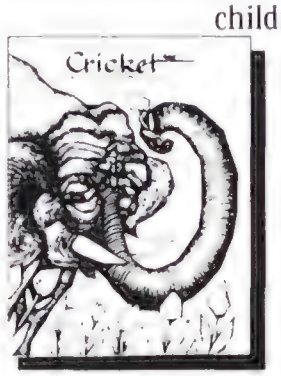
Card # _____ Exp _____

Signature _____

COLLIN STREET BAKERY Box 524 • 401 W. 7th Ave. Corsicana, Texas 75110

Cricket
the magazine for children

. . . is for very special children who are curious about their world, who love to read, who have adventurous minds and active imaginations . . .
children just like yours!



"A fine literary magazine for children, this monthly has no living peers Unfortunate, indeed, are those who pass through the years of 6 to 12 unacquainted with CRICKET."
–BOOKLIST

$14.95 for an EIGHT-ISSUE TRIAL subscription. Send no money. We will bill you later. *Save over $15.00 off the regular twelve-issue price!* Order now by calling toll free or by sending us the coupon below.

Name _____
Address _____
City, State, Zip _____

1-800-BUG PALS (1-800-284-7257)
CRICKET, Box 52933, Boulder, CO 80322

5SMW4

and within minutes Norman Creadick was hurrying off to New Haven Hospital. A quick examination confirmed her fears. But the obstetrician knew immediately that hers was not an ordinary miscarriage. Her temperature was nearly 105, frighteningly high for an adult, and she was experiencing severe chills.

"Dr. Creadick told me, 'Don't even get dressed,'" Anne Miller recalls. "He called an ambulance and they just bundled me up, still in my wrapper, and carried me down the stairs into the ambulance." She was rushed to the New Haven Hospital isolation ward, where a blood test showed that her bloodstream was riddled with bacteria. Creadick summoned her family physician, internist John Bumstead.

Dudley Miller, Anne's brother-in-law, was administrator of the hospital in 1942. "It was touch and go almost from the start," Miller, now 87, remembers. "Even at first, her blood count showed as high as 25 bacterial colonies per milliliter, a huge number. She was seriously, seriously ill. When you turned away from her bed for a minute, you didn't know if she'd be alive when you looked back."

The doctors tried sulfa drugs first. The infection and high fever persisted. On February 21 her fever soared beyond 106 and she was given a blood transfusion the next day. She developed inflammation of the blood vessels in her pelvis and thighs. The veins were tied off, and she received a second transfusion three days after the first, then another, two days later. The fever reached almost 107. The doctors tried scarlet fever serum, then rattlesnake serum, to no avail. The bacterial colonies in what should have been germ-free blood were counted at 25, 50, 100. It seemed obvious that, short of a miracle, 33-year-old Anne Miller was doomed to die.

The miracle Anne Miller needed was not that far away, in Rahway, New Jersey, in the hands of Norman Heatley, who had recently come from the Oxford group to work on penicillin

at Merck Laboratories—but that gets ahead of our story. Three years earlier, before the Oxford group received a $5,000-a-year grant from Rockefeller, Ernst Chain set out to analyze penicillin's bacteria-killing properties. Within a year he had drawn a chemical picture of the complicated compound and shown repeatedly that it could destroy certain types of bacteria in test tubes.

By then, World War II had broken out. "The professor [Florey] began to think of the implications for war wounds," Heatley says. "We knew that in World War I there had been enormous casualties from gas gangrene, for example, and our crude penicillin seemed to be effective against the gas gangrene organism. That stimulated us to work as hard as we could." Before long, basic research into antibacterials had been diverted into concentrated work on penicillin.

By early 1940, the experimenters had obtained enough penicillin to convince Florey to test it on infected animals. By the standards of today's laboratory protocols, penicillin's first live test was deceptively simple. Eight mice were given a potentially lethal injection of streptococci. About an hour later, two were given a single dose of penicillin, under the skin. Two others received multiple doses, spaced at two-hour intervals. The

Norman Heatley (left) and Dr. Charles Fletcher talk on Dunn School steps.

First Ladies Wear this Necklace

only from Kenneth Jay Lane

18 karat gold embellished clasp; imported alabaster pearls

FOR YEARS FIRST LADIES have worn jewelry created by Kenneth Jay Lane, "The King of Costume Jewelry". This is the same 16" KJL faux pearl necklace you have seen in news photos on recent magazine covers. Now you can wear it too.

These pearls are imported alabaster enrobed in real pearlescence. They are large (10mm), individually hand-knotted, and fastened with the KJL signature clasp lavishly embellished with 18 karat gold.

If real pearls, this necklace would cost $250,000. But like the first ladies, you can own the authentic KJL necklace for only $95. Matching earrings (clip or pierced) $39. 30-day money-back guarantee. Lifetime warranty against breakage and tarnishing.

Call Toll-Free (24 hrs., 7 days)
800-233-3489, ext. 446
to order with VISA or MasterCard. Or mail check including $3 shipping/handling (NY & RI res. add sales tax) to KJL (Dept. 446), 417 Fifth Ave., NY, NY 10016

K•J•L by Kenneth Jay Lane
Worn by the World's Most Admired Women™

TRAVCOA'S
South America

Treat yourself to the luxury of escorted travel. For 36 years Travcoa has been leading deluxe tours to the far corners of South America - a remakable achievement in the industry!

Join us as we explore the secrets of the Amazon and Patagonia and encounter the giant tortoises of the Galapagos. Experience life in Antarctica at a research station or visit the stone men of Easter Island.

You will enjoy the luxury accomodations of Manaus' Tropical hotel and watch the sun set on the Rio Negro. Or, stay at a 16th century conquistador's villa in Cuzco.

Travcoa offers 22 itineraries to South America with over 215 departures during the year. Treat yourself!

For free brochures return this coupon or call toll free 800-992-2003. In California 800-992-2004.

TRAVCOA
Travel Corporation of America
P.O. Box 2630, Dept. SM11
Newport Beach, CA 92658

Name _____
Address _____
_____
My Travel Agent _____

Send free brochures:
❑ South America
❑ Africa
❑ Antarctica
❑ Egypt/Holy Land
❑ Europe
❑ India
❑ Orient/China
❑ South Pacific
❑ Private Jet Tour

remaining four, the controls, were left untreated.

Heatley was assigned to stay with the animals throughout Saturday afternoon. After several hours, the untreated animals began to look ill. "Some friends of mine home from the RAF came by, and we went out to dinner," he recalls. "I stayed with them until about 10 P.M., then came back to the laboratory. The sick mice were looking considerably sicker, but the others were still healthy and frisking about. After about 13 hours, one mouse died. I stayed until about 3:45 A.M. All of the untreated mice were dead, but the others were still healthy. The results could not have been more clear-cut so I went home."

The very next morning, Heatley recalls, plans were drawn up to extend the test to humans. The first problem was to increase the yield of penicillin. Even the tiny amounts of the drug used for the mice represented at least an entire week's production.

Over the next year, the research laboratory was transformed into a penicillin factory. The mold seemed to grow best in very shallow containers with a large surface area of culture medium. Thus penicillin was cultivated in laboratory dishes, serving trays, pie plates, cookie tins, milk bottles on their sides—stacked everywhere, one atop another. Eventually the group found the ideal culture vessel—old-fashioned, covered bedpans (p. 175) borrowed from nearby Radcliffe Infirmary.

Florey decided to try penicillin on humans in early 1941. But first he had to prove its safety. He asked the Radcliffe Infirmary director to arrange a trial on a dying patient. Florey was describing his proposal when a young hospital physician, Charles Fletcher, entered the office.

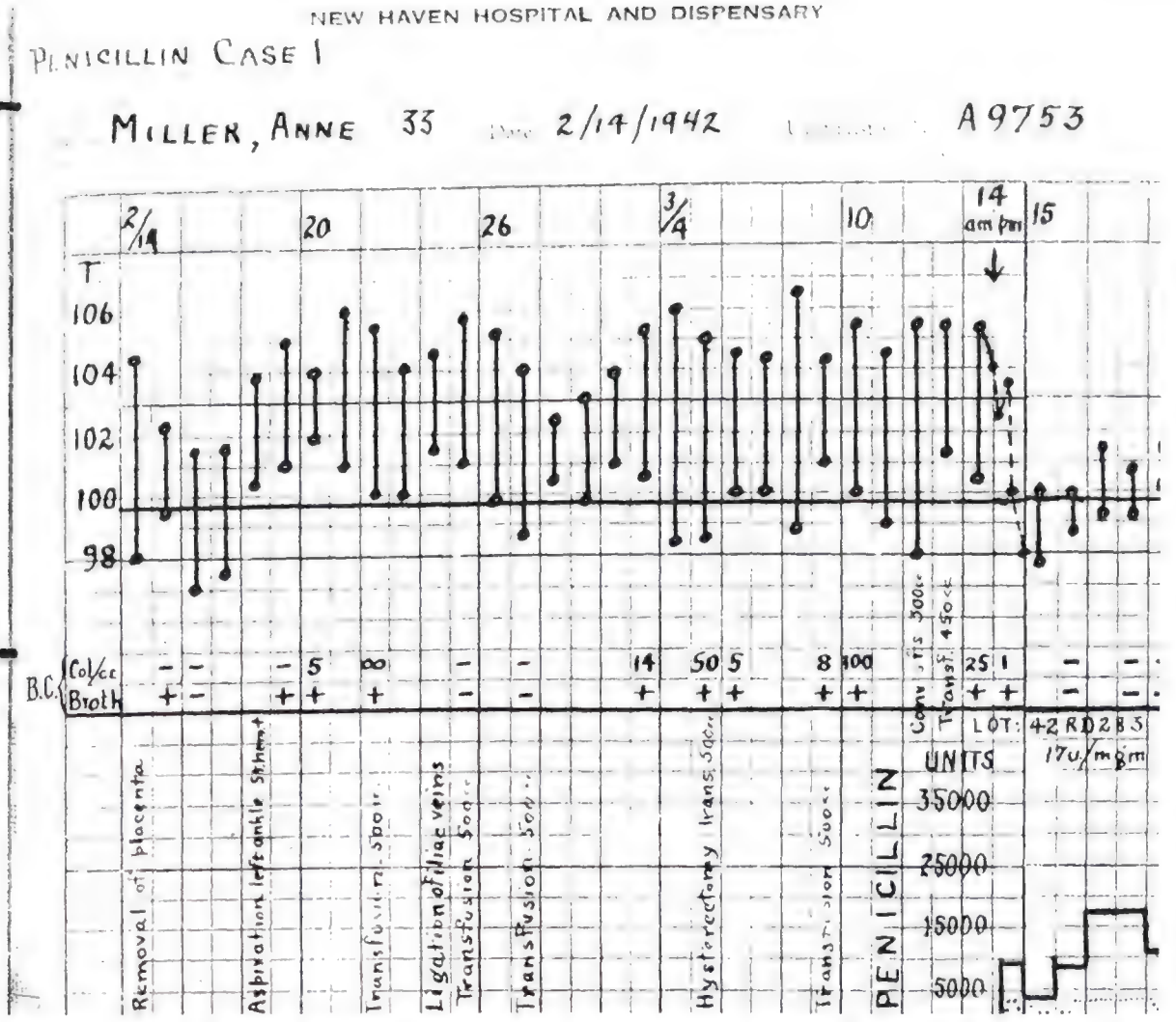
Fletcher, who became a prominent respiratory specialist and is now in retirement in South London, remembers the meeting as if it were yesterday. "Florey explained that they had developed this remarkable stuff that seemed to have the extraordinary property of being able to kill strep infections in mice. There was no reason to suppose that it might be harmful to humans, but first they wanted to test it for toxicity on a patient with a fatal disease, someone who was going to die anyway. They wanted me to find such a person. I agreed immediately."

A first trial, for toxicity, was compromised by impurities in the penicillin batch. Fletcher then chose a 43-year-old police constable, Albert Alexander, who had been scratched near the mouth by a rose thorn. The simple wound had developed both staphylococcal and streptococcal infections. Alexander had multiple abcesses of the head and face; his lungs were infected; one eye had been removed. He was in great pain and the only hope

LOEWS HOTELS. YOUR PLACE IN THE WORLD.

Tucson, Arizona · Los Angeles, California · San Diego , California (Fall '91) · Denver, Colorado · Annapolis, Maryland · Teaneck, New Jersey · New York, New York · Nashville, Tennessee, · Dallas, Texas · Washington, D.C. · Quebec City, Canada · Principality of Monaco · For information call 800 223 0888.

LOEWS HOTELS.



Anne Miller's hospital chart shows miraculous temperature drop as penicillin was given (dates run across top, temperature along left side). Bacterial colony counts (B.C.), left center, were recorded once at infinity ("lazy 8" sign).

was for a merciful death. Fletcher developed an intravenous drip method, which would infuse penicillin at a slow, steady level, and began the treatment one afternoon. By next morning, Alexander's fever fell and he began to improve.

One of the characteristics of penicillin is that much of it passes unchanged through the body and is excreted in the urine. Half or more of a dose can be recovered. Florey quickly saw a method of extending the meager supply. Each day, Fletcher took the policeman's collected urine and bicycled across Oxford to the Dunn School, where the penicillin would be separated from the urine and returned for reuse. With each exchange, however, some penicillin was lost. By the fifth day, Alexander's fever disappeared; he sat up and ate; the infection appeared to be routed. But then the penicillin gave out. Alexander clung to life gamely for another month. But

Introducing a health club workout, without the health club hassle.

A 30-minute drive. 20-minute wait. And 40-minute workout on 12 pieces of equipment.

A 10-minute workout. In your own living room. On the Nordic Fitness Chair.

Introducing the Nordic Fitness Chair by NordicTrack, a revolutionary new product that lets you avoid health club hassles and strength train in the comfort and convenience of your own home.

By simply adjusting the chair's arm into five different positions, you can exercise all the major muscle groups in your upper and lower body.

Do our 10-minute "Basic 6" workout, or choose from over 30 upper- and lower-body exercises to develop your own personalized routine. Either way, the Nordic Fitness Chair will give you all advantages of a health club workout, in a fraction of the time!

Try the Nordic Fitness Chair for 30 days at home.

Call:
1-800-848-7786

NordicFitnessChair™
from NordicTrack

Send for
FREE VIDEO & Brochure

Call Toll Free in U.S. and Canada
1-800-848-7786

❑ Please send me a free brochure
❑ Also a free video tape

Name _____
Street _____
City _____ State _____ Zip _____
Phone ( ) _____

NordicTrack 141C Jonathan Blvd. N.,
Chaska, MN 55318

880K0 A CML Company

Proud as a ...

9 3/8" x 13 3/4"

The *Peacock* was one of Tiffany's greatest masterpieces — the ideal subject to utilize his unique talent of painting with glass. Created in 1912, the original window is now in a private collection. Artists of The Stained Glass Guild apply 18 transparent colors to thick cathedral glass to achieve the authentic and vivid hues, from rich blues, lavenders and golds. Then the glass is fired in a red-hot kiln, fusing paint and glass as one. The effect is stunning.

Please send ___ *Tiffany Peacock* stained glass tableau(x). $77 each, including shipping. Includes chain, clear easel, elegant gift box and Certificate of Authenticity.
❑ Send color catalog ($2), good toward first order.
❑ Check enclosed for $_____.
❑ Charge $_____ to: ❑ VISA ❑ MasterCard
No. _____ Exp. _____
Virginia residents, please add 4.5% sales tax
Name _____
Address _____
City/State/Zip _____

The Stained Glass Guild
A division of the United States Historical Society
Dept. S11 25 E. Main Street, Richmond, VA 23219
Call toll-free, 1-800-446-7968

Designed with a woman in mind

Glistening sterling silver earrings derived from a rare totem pole design. The pole, carved for the Tlingit Indian village of Tongass, was one of the few ever dedicated to a woman. The earrings are shown actual size. **$29.95 postpaid.** Credit card orders call TOLL-FREE 1-800-262-0040. Or send check or credit card number/exp. date to:

Coldwater Creek

Dept. G6, 212 N First Ave., Sandpoint, ID 83864

finally, after being on the brink of recovery, he died.

It was crushing to be so near success and then to fail. Yet it was also tremendously encouraging. As Fletcher says, "Nothing so remarkable had ever happened before." The team felt sure now that penicillin could defeat human infection—if they had enough of it. They decided to stretch the slim supply by treating only children, who required smaller amounts, or adults with localized infections. Fletcher's next candidate was a man with a carbuncle four inches in diameter—"Few doctors nowadays can have seen a carbuncle like this." Fletcher injected the carbuncle with penicillin and after five days it "had just melted away." He then tried penicillin on two children and an infant with serious infections, with excellent results in two of the three cases.

Another case ended tragically. Fletcher chose a 4½-year-old boy with a cavernous sinus thrombosis, an expanding blood clot within the skull, usually the result of an eye or nose infection. The condition, scarcely known to medicine today, was considered a sure death sentence. Sulfa drugs had been useless. The eyes of the feverish, delirious child were bulging pathetically and were completely closed by the condition; Fletcher gave him only a few hours to live. Fletcher administered the first dose of penicillin; the response was encouragingly rapid. The boy's fever dropped; his eyes returned to normal. Within a week, he was sitting up and playing with his toys. Then tragedy struck. A weakened blood vessel burst and he died within minutes. An autopsy showed that the condition had been cured, but that the blood vessels had been damaged by the thrombosis.

The six cases convinced Florey that penicillin was a proven commodity, ready for mass production. But the threat of a German invasion of Britain was considered so real that Florey had instructed each team member to smear some of the precious mold in his coat lining, so that the supply would be preserved "in case the panzer divisions roll down Headlington Hill," as Heatley recalls.

America, with a burgeoning pharmaceutical industry, was Britain's unofficial ally and was well out of the range of Nazi bombs. Florey had U.S. connections through the Rockefeller Foundation. Moreover, an American

"Penicillin girls" inoculate cultures in newly designed vessels. It took 10 to 14 days of incubation before the penicillin was ready.

friend was sheltering Florey's children for the duration of the war. He was the renowned neurophysiologist John F. Fulton, at Yale.

Neither penicillin nor the concept of antibiotics was wholly new to American scientists. In 1935, Roger Reed, a graduate student at Penn State, had stumbled across Fleming's discovery. He confirmed both its antibacterial effects and its instability. As a graduate student, however, he had no funds to pursue his research and was actively discouraged by his professor, who saw no future in penicillin. Reed's work stopped. Then, in 1939, the great René Dubos, at the Rockefeller Institute, discovered gramicidin, now said to be the first antibiotic. Isolated from soil, gramicidin halted bacterial growth and checked staphylococcus infections in mice. Unfortunately, just as other scientists had predicted, it also destroyed red blood cells and killed the mice.

In 1940, Martin Dawson and Gladys Hobby, at Presbyterian Hospital in New York, obtained some of Reed's penicillin, successfully treated some mice with it and then tried it on humans. Hobby, now retired in Kennett Square, Pennsylvania, recalls that Dawson was driven by a desire to cure bacterial endocarditis, an inevitably fatal infection of the heart valves.

Dawson's first patients actually preceded those at Oxford and Anne Miller, Hobby recalls. But none was cured. "We found later that we had given doses far too small to have had much effect," she says.

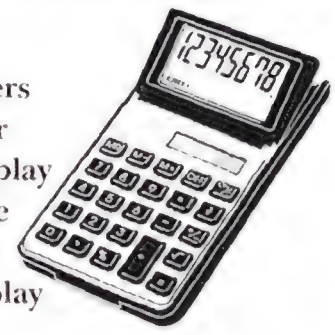
None of this American history was known in New Haven in March 1942, where both Anne Miller's family and her doctors had all but abandoned hope. One entry on her hospital chart for that period shows the infinity symbol for the number of bacterial colonies in her blood (p. 179).

John Bumstead, her family doctor, was at her bedside when he received news that another patient of his was in the isolation ward—Florey's friend Dr. John Fulton.

Alden
Custom Bootmakers
since 1884.
Alden's original leisure handsewn is now offered in genuine shell cordovan, both black and our popular dark cordovan finish.
For complete store listing and illustrated brochure, write: Alden Shoe Company, Dept. 11S, Middleborough, MA 02346.

NO MORE EYE STRAIN WITH THIS SMALL CALCULATOR!

- Big Numbers
- Dual Power
- 8 Digit Display
- Extra Large Adjustable Angle Display



I liked this calculator so much I bought one for myself and three more to give to friends. When I use a calculator it's usually to do my bills and checkbook, but I've always been disappointed in the ones I've had until now. The Aurora BX-2 is small and lightweight enough for pocket or purse. The keys are large enough for my fingers. But here is the big difference. The **extra large numbers** are really easy to read in the adjustable angle display. I love the BX-2 and so will you. Send **$29.95** for the best little calculator you've ever owned.

Send check or money order to

RARE CARGO LTD.
2578 Malabar
Las Vegas, Nevada 89121

ORIGINAL
Made in West Germany

Schuco

Replica 1936 Grand Prix Mercedes

5 1/2" long

All metal body using the original 1930's tooling. *Features include:* rack and pinion steering, key-wind clockwork motor, visible working differential and swing axles, metal wheels with knock-off hubs and "changeable" rubber tires; car comes complete with speed jack, tool kit and spare parts. In silver, red, blue or green with assorted racing numbers. Quantities are limited.

$55

Please send me #____ Schuco Classic 1936 Mercedes. Schuco Mercedes $55 ea; Shipping $5 ea; In CA add tax $3.71 ea; Total in CA $63.71 ea. **Satisfaction Guaranteed.**
Name____
Address____
City____ **State**____ **Zip**____
Color preferred: ☐ Red ☐ Silver ☐ Blue ☐ Green
Payment via: ☐ Enclosed check ☐ VISA ☐ MC ☐ AmEx
Card #____ **Expires**____
Mail to: Lilliput 555 Sutter Street, San Francisco, CA 94102. **Or Call:** (415) 986-2277 **FAX:** (415) 986-2019
VISA/MC/AmEx only. Sorry, no CODs.

A Special Membership Benefit...

The ASSOCIATES' COURT

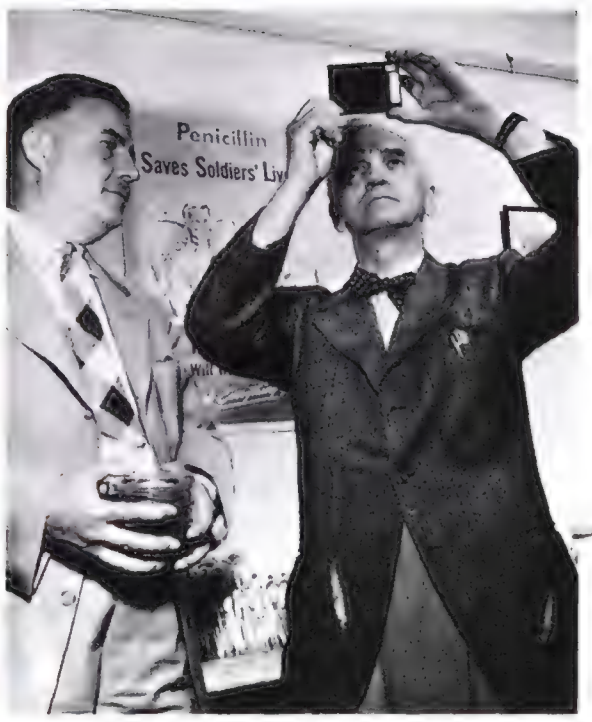
Fine buffet dining at the Smithsonian

Created especially for Smithsonian members, the Associates' Court is located in the Natural History Museum, Constitution Avenue at 10th Street. Enjoy the soup and salad bar or our bountiful lunch and weekend brunch buffets for a perfect break in your fast-paced day of museum going.

Monday-Friday
Open 11:00 a.m. to 3:00 p.m.

Saturday & Sunday
Brunch served 9:30 a.m. to 3:00 p.m.

Members arriving before 11:30 a.m. receive a 10% discount



Alexander Fleming examines slide of a culture at U.S. mass-production lab.

Fulton had been commissioned to study an outbreak of a respiratory illness in California military installations. In the process he had contracted the disease himself—a fungus-borne disorder called San Joaquin Valley fever—and had come home to be hospitalized. Bumstead, Fulton recorded later in his diary for March 12, came in, sat on his bed and related the sad plight of Anne Miller and the apparently futile struggle to save her life. By then, her fever had been peaking between 104 and 106.5 for 11 consecutive days. Bumstead asked Fulton to help him obtain Florey's remarkable "miracle drug."

Fulton called the Merck plant in New Jersey. Heatley was ready. "As soon as we received approval, we prepared the desired amount of penicillin and sent it off," he says. The exact method of delivery seems lost to history. Fulton's diary says the precious penicillin was sent by airmail. Heatley recalls dispatching a Merck messenger who, he believes, traveled by train. Dudley Miller tells an exciting story in which New Jersey state police sped the messenger to the state border, turned him over to New York state police, who in turn transferred him to a Connecticut state police es-

Great Stocking Stuffers

Give Him The Gift That's Certain To Be His Favorite Tie.

For Christmas • Hanukkah • Birthdays • Or Any Occasion

Delight every man on your gift list with a beautifully woven club tie that shows his favorite sport or hobby in rich jewel-like colors and charming detail. A hand-sewn tie that's certain to look smart and fun to wear.

Choose from 24 distinctive designs, specifying a Navy or Burgundy background.

ORDER NOW! Only **$18.95** for 1 tie. Or save: 2 for **$34.95**, 3 for **$50.95**, 4 for **$65.95.** Add $2.75 for S&H. Check, MasterCard and VISA (acct. no. & exp. date) accepted.

Holiday delivery guaranteed by 12/21 if order received by 12/18.

Call toll free: 1-800-552-TIES, ext. 30.

Send to: His Favorite Tie, 27 Glenn Way, P.O. Box 758-D, Holmdel, NJ 07733

Your Satisfaction Is Guaranteed.

His Favorite Tie®

© Copyright 1990. NECKWEAR

cort. By whatever route, the package was delivered into eager hands at New Haven Hospital shortly after noon on Saturday, the 14th.

Now that they had the mysterious stuff, no one knew quite what to do with it. That is the recollection of Dr. Thomas Sappington, who was then an isolation ward intern. "We had no guidelines to follow," he says. "We didn't know the proper dose, nor how often it should be given, nor for what duration. We didn't have much, either—about five grams was all they could spare, about a teaspoonful. I had one clear instruction about penicillin. Don't drop it on the floor.

"After some discussion," he continues, "Dr. Bumstead settled on a test dosage of [850 units]. We dissolved about a gram of the drug in saline solution, passed it through a filter to remove any wayward bacteria and injected it about 3:30. When she seemed to tolerate it well, it was decided to give [3,400 units] every four hours through the night."

Bumstead administered the initial injection, with Sappington and other staff looking on. Later the task fell to

Stone given by the Lasker Foundation commemorates penicillin's development.

A Facsimile Edition of George Catlin's Famous Lithographed Portfolio of Indian Paintings

- *A limited edition from The Library of Congress and Abbeville Press*
- *Strictly limited to 950 sets in Portfolio or Bound Volume Edition*
- *Meticulously reproduced using the rare Collotype Printing Process*

To reserve your set, or to order your free prospectus describing this remarkable publication, call Morley Klausner at (212) 888-1969.

Abbeville Press, 488 Madison Avenue, New York, N.Y. 10022
(800) 227-7210 • (212) 888-1969

WORLD'S FINEST INDOOR ROWER

"As the water swirls in the tank it sounds like rushing waves. The total effect is something like running on the beach."
The New York Times Magazine

WaterRower Inc.
10 Eagle St.
Providence, RI 02908
(800) 852-2210
FAX: (401) 861-9196
WATER ROWER

PATENTED WATER FLYWHEEL

Unblinking, yet friendly. Immobile, yet movable. Nearly life-sized (47"h), yet eats virtually nothing. Achieve the pride and obvious stature of livestock ownership with none of the smell, clean-up and pre-dawn chores. No, you cannot milk the Yard Cow, but you'll admire her for many years — she's made of ½" outdoor signboard, hand-stenciled on enamel. Indoor and outdoor supports incl. Begin with 1 at $63, or start your own herd of 3 for just $173, ship. incl.

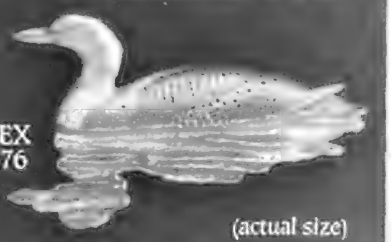
1-800-343-8429 • MC/VISA
9am-5pm DST/PA Res. add 6% S.T.
© K.L. Mullen Millwork
2301 Ritner Hwy, Carlisle, PA 17013
© 1989

THE YARD COW

LOON PIN
by Vern Wayne Pond

In Sterling silver—$45; 14K Gold—$315
Gift boxed, satisfaction guaranteed.

Vern Wayne Pond
609 E. Market St., #103
Charlottesville, VA 22901



VISA/MC/AMEX
1-800-284-8376

(actual size)

World's Largest Bronze Supplier
FREDERIC REMINGTON
BRONZE COLLECTION

"COMING THRU THE RYE" $475
"Lost wax casting"
HENRY BONNARD BRONZE CO. AND ASSOCIATES
4305 S. Highway 17-92
Casselberry, FL 32707
407-339-9103
1-800-521-3179

Call or Write for Free Catalog
Marble bases and shpg. & hdlg. additional

Goose down robe

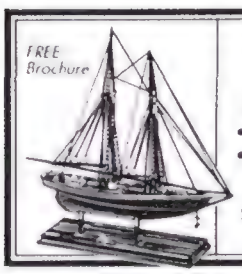
Surround yourself in warm, lightweight elegance. Superblend fabric for easy care Contrasting piping, shawl collar and roll back cuffs. Fully guaranteed. Order cream, peach, light blue, salmon or navy. Sizes XS, S, M, L Regularly $160 Sale $89 Shipping and handling, $4

Goose Down Slippers match robes in cream, peach, light blue, salmon or navy. Sizes XS, S, M, L. Regularly $38. Sale $22 Shipping $2.50

☐ Order by phone with MC or VISA, call 415/472-2154.
☐ Use MC, VISA or check for mail orders. CA residents add 6.25% tax

WARM THINGS

180 Paul Dr., Dept. SO /San Rafael, CA. 94903
415/472-2154—Ship within 48 Hrs.—MC/VISA

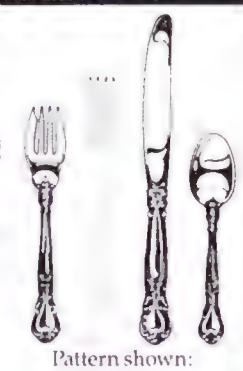


SEACRAFT
CLASSICS

DISTINCTIVE SHIP MODELS
• Hand carved mahogany and teak
• 18" to 34" • Fine details • From $495
Call 1-800-356-1987
Seacraft Classics, 6623 N. Scottsdale Rd.
Scottsdale, AZ 85250, (602) 951-9518

MISSING A PIECE OF YOUR PATTERN?

Now you can replace pieces or add to your sterling silver collection at up to 75% off retail prices. We specialize in new and used flatware and holloware, with over a thousand patterns in stock. Call or write for a free inventory of your sterling. *(We also buy sterling, with a careful appraisal for maximum value.)*



Pattern shown: Chantilly by Gorham

Beverly Bremer
SILVER SHOP

3164 Peachtree Rd. NE, Dept. SM Atlanta, GA 30305
Phone (404) 261-4009 Hours 10-5, Mon.-Sat.

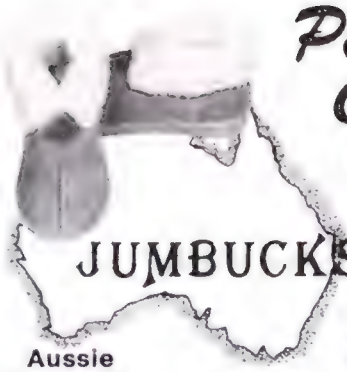
Sappington, who recalls with a groan pulling himself out of bed at midnight and 4 A.M. Thus, the newly graduated physician, only a few months out of medical school, was the first to see Anne Miller come back to life. "Here was this attractive-looking young lady who was dying on Saturday," he recalls, still with a tone of awe, "and on Sunday her temperature was normal, she had come back to her senses, she was able to eat and all her vital signs were stable. Nothing in my whole experience has ever compared to that. Nothing like it had ever happened before."

Fulton was equally excited. He wrote in his journal on Monday: "By 9 A.M. Sunday her temperature was normal for the first time in four weeks and has stayed normal until this writing. . . . She has eaten several enormous meals—also for the first time in four weeks. It really looks as though Florey had made a ten-strike of the first water, and I am glad we have had opportunity to make the first clinical trial of the American extract here."

By Sunday afternoon, Anne Miller was acting almost as if she had never been ill. She was able to sit up and greet her husband and inquire about the children. Dudley Miller remembers: "She was weak, she had lost considerable weight, but she was almost her old self again." Anne Miller's own recollections of the first few days are cloudy. "But I do remember that what I wanted most was to get out of bed, out of the ward, and breathe fresh air again."

By today's standards, Anne Miller received only small doses of penicillin; a million units per dose is commonplace now, but the maximum she was given was calculated at 35,000 units—the precious supply was scant and had to be carefully doled out.

The miracle of Anne Miller elated not only her grateful friends in New Haven but the scientific world as well. "The hospital has been very excited because of the extraordinary results," Fulton recorded in his diary. At Merck,



Pure Comfort!

JUMBUCKS

WASHABLE AUSTRALIAN SHEEPSKIN SLIPPERS & BOOTS

Write or Call 1-800-950-2668 for FREE CATALOG

Aussie Connection 825 N.E. BROADWAY Portland, OR 97232

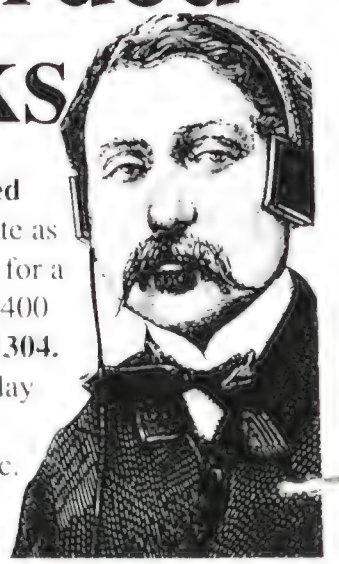
Cartouche

18 K Solid Gold from $140.00
Sterling Silver from $ 35.00

A talisman with your name in Ancient Egyptian Hieroglyphics.

Free info. 1-800-283-4978 Visa • MC • Am-Ex • Disc.
Or write: Cartouche, Box 8474-1* Pgh., PA 15220

Recorded Books



Listen to **unabridged** bestsellers on cassette as you drive. Call now for a free catalog of over 400 titles: **1-(800)-638-1304.** Ask about easy 30-day rentals by mail. Recorded Books, Inc. Box 409, Charlotte Hall, MD 20622

SIR WILLIAM RUSSELL FLINT

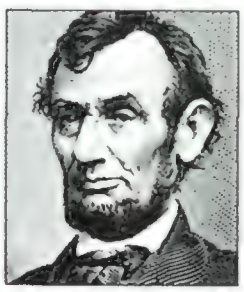
New Illustrated Biography
100 Lavish Color Illustrations
ORDER NOW $75 (919) 833-2535
Free Brochures of WRF Prints
THE MICHAEL STEWART GALLERY
300 GLENWOOD AVE., RALEIGH, NC 27603

OWN A PIECE OF HISTORY

We deal in original letters and documents written by famous people. Americans, World Leaders, Scientists, Authors, Artists, Composers and many more.

Call toll-free or send $2 for our catalogue today.

Please include phone number and individuals of interest



A. Lincoln

American Historical Guild
130 Circle Drive, Suite 200
Roslyn Heights, N.Y. 11577
(516) 621-3051 • 800-544-1947

At 82, Anne Miller lives in Washington, Connecticut, and still enjoys travel.

Heatley recalls, the news of Miller's amazing recovery—and Merck's role in it—galvanized the production process. Charles Pfizer & Company, another pharmaceutical firm, now agreed to begin making penicillin; before long, several other firms had joined in. The early supplies were designated for the military, but fortunately by November 1942, when a fire at the Coconut Grove nightclub in Boston claimed more than 500 lives, there was enough penicillin available to treat civilian burn victims.

The health revolution brought about by antibiotics was almost instantaneous. In 1943 Selman Waksman of Rutgers University announced the discovery of streptomycin, a new antibiotic effective against infections that penicillin could not reach. Before long, a whole armamentarium of antibiotics had been introduced and were in wide use.

Rocko Fasanella, a semiretired professor of ophthalmology at Yale who was a medical student assisting at Anne Miller's bedside in 1942, has made himself an amateur historian

CHART YOUR TRAVELS!

Record past & future trips! Stimulate a world of conversational interest. Savor the memories. Enjoy the excitement of planning your travels! Excellent for reference and charting business territories.

The back of all maps features a detailed record for all past & future trips, showing: dates, destinations, carriers, places of interest, etc.

All maps are in full color, framed and come with charting kit including map pins, charting curve ruler and marking pen.

THREE SIZES AVAILABLE

STANDARD 30" x 20" printed on heavy artcraft stock. Framed in rich walnut finish wood. Ready to hang.
World or U.S. **$38.00**
(2 or more $35.00 each)

DELUXE 33" x 22" map laminated with thick 10-mil Poly-Mylar™ film. Surface can be wiped clean with damp cloth. Framed in rich walnut finish wood. Ready to hang.
World or U.S. **$49.50**
(2 or more $45.00 each)

KINGSIZE 52" x 34" map laminated with thick 10-mil Poly-Mylar™ film. Surface can be wiped clean with damp cloth. Framed in gold anodized aluminum. Easy to assemble.
World or U.S. **$99.50**
(2 or more $95.00 each)

ADD $5 ea. FOR SHIPPING & HANDLING
PERSONALIZED: Name hand lettered add $5 ea.

VISA, MC, AE phone orders
1-800-322-1866
In California (818) 986-1866

MONEY BACK GUARANTEE

THE CHART HOUSE TRAVEL MAP CO., INC.
13263 Ventura Blvd., Studio City, CA 91604

☐ Standard ☐ World ☐ U.S. ☐ Deluxe ☐ World ☐ U.S. ☐ Kingsize ☐ World ☐ U.S.

Send _____ maps $_____ Total.

☐ VISA ☐ MC ☐ AE ☐ Check enclosed

Card # _____ Exp. _____

Name _____

Address _____

City, State, Zip _____

SM1190

Farm Fresh California Almonds

Nature's Snackfood!

Buy Directly From the Grower and SAVE!!

$1.99 Per Lb.

Buy your Natural California Almonds directly from our ranch in the sun-drenched San Joaquin Valley. Picked fresh from the tree, shelled, sorted, then shipped directly to you or your friends as gifts. And, ideal as an ingredient in recipes. Choose from three convenient sizes.

You can't lose with our 30-Day Money Back Guarantee

Mail to: P-R Farms
2917 E. Shepherd, Clovis, CA 93612

Send me these Natural Almond packs:
____10 lbs. @ $19.90 (plus $7 shipping)
____5 lbs. @ $14.50 (plus $4 shipping)
____25 lbs. @ $45.50 (plus $14 shipping)
Alaska/Hawaii add 30% to shipping
Payment Enclosed:
_____Check _____Money Order
_____VISA _____Mastercard
Card #_____ Exp._____
Name _____
Address _____
City _____
State _____ Zip _____
Phone _____

Free Pears

We provide the Pears. You pay the Federal Express.®

Delivered to your door orchard fresh, our smooth and creamy Comice Pears come with a money-back guarantee. For only $6.95, we'll Federal Express 10 to 12 sample-sized rare Comice Pears, a free gift catalog, and a free $5.00 gift certificate toward your first purchase of $25.00 or more.

Order Gift No. 624
Call Toll-Free 1-800-759-1232

Please allow 3 working days for delivery. Offer available October 10 to November 15, 1990. Limit one per family.

☐ I've enclosed $6.95 for Federal Express shipping.
Please send FREE pears to:

Name _____
Address _____
City _____
State _____ Zip _____ Phone _____
Federal Express will not deliver without a phone number.

PINNACLE ORCHARDS
441 S. Fir, Dept. 624, Medford, OR 97501

G·H·O·S·T·S
1991

THE ULTIMATE AVIATION CALENDAR

FAMOUS AIRCRAFT OF WWII

14 Magnificent Photographs by Philip Makanna. **In Full Color.** Suitable for Framing. Each Page 20" x 14", Fold Out 20" x 28". Includes Aircraft Specifications and Silhouettes.

$12.95 Plus $3.00 Shipping/Handling
California Residents Add 6% Tax
Foreign Orders in US DOLLARS ONLY. Foreign Surface Mail: ADD $5.00. Foreign Air Mail: ADD POSTAGE FOR 3 LBS

CALL TOLL FREE 800-331-8231
IN CALIFORNIA 800-642-4554
MasterCard/VISA Only

Or Send Check/Money Order for $12.95 Plus $3.00 to:
GHOSTS, 665S Arkansas St., San Francisco, CA 94107

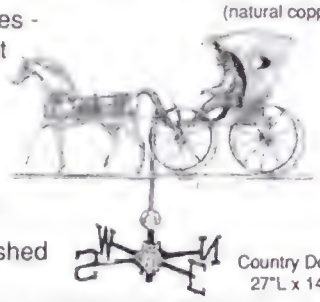
WEATHERVANES

The Good Old-Fashioned Kind

— "Priced with your budget in mind" —

★ All Copper Figures - Rounded, not flat cut-outs
★ Solid Brass Directionals. All Copper Spacer balls. Steel Rod.
★ Antiqued or Polished Finish

(natural copper)



Country Doctor
27"L x 14"H

COLOR CATALOG of more than 50 Weathervanes, Cupolas and More, **$1.00**

GOOD DIRECTIONS, Inc.
24 Ardmore Rd. Dept. 500, Stamford, CT 06902
(203) 348-1836

INQUIRIES?

- **Change of address**
- **Dues payment**
- **Gifts**
- **Report missing issues**
- **Correspond about related matters**

Write to:

SMITHSONIAN
MEMBERSHIP-SUBSCRIPTION
DATA CENTER
P.O. BOX 55593
BOULDER, CO 80322-5593
TELEPHONE (303) 449-9609
Please include address label from recent issue.

PLANET EARTH
A COMMEMORATIVE EARTH DAY POSTER FROM THE APRIL 1990 SMITHSONIAN

The Poster measures 21¾" x 28¾"
Printed on Recycled Paper
Allow 4 to 6 weeks for delivery

Send $5.00 with address to:
Smithsonian Magazine, P.O. Box 23624,
Washington, D.C. 20026-0624

of America's—and Yale's—contribution to penicillin. "American penicillin won the war," Fasanella says. "People talk about the impact of the atomic bomb. But I think the discovery of penicillin was equally important." German and Japanese scientists knew of Fleming's discovery, Fasanella points out, but were unable to follow up and put the drug into production. The Allies, on the other hand, had enough penicillin by D-Day, in 1944, to treat all serious British and American casualties of the European invasion; before the war ended, penicillin was already being released for civilian use. Even military personnel with certain venereal diseases were quickly cured and sent back to duty.

After the war, the antibiotic revolution vastly changed not only the practice of medicine but also human expectations and attitudes about health. Bacterial illnesses virtually disappeared as major causes of death, and isolation wards were eliminated. Life expectancy lengthened, focusing attention on the chronic diseases of longer life, such as diabetes, heart problems and cancer. As chemotherapy proved itself, the American pharmaceutical industry blossomed into a multibillion-dollar industry.

In 1945, Florey, Chain and Fleming received the Nobel Prize. Fleming, thanks to the appealing story of his accidental discovery, became an international celebrity, although he always insisted gallantly that others had been more responsible for penicillin's development. Florey's Oxford team continued their antibiotic research, which led to the discovery of cephalosporin and helped in the development of new varieties of penicillin that could combat "bugs" that were resistant to the original penicillin. Chain left Oxford bitterly, believing he had never received proper credit for his work and that the American drug industry had cashed in on his research.

With time, penicillin itself was seen as an incomplete miracle. It could not reach all infections and created aller-

gic, even fatal, reactions in susceptible persons. But it ushered in the age of miracle drugs and, with it, today's age of high-tech medicine.

On May 8, 1942, Anne Miller left New Haven Hospital for the home she had never expected to see again. The first beneficiary of the era of wonder drugs had lost 40 pounds from her 5-foot-8, 130-pound frame and had grown her first gray hairs. The three months of hospitalization in those pre-insurance days had "cost us a fortune," she recalls, which would not be paid off for several years. And she still did not feel totally healthy. "It was August before I was up to running a house again," she says, "and a year before I was my normal self. But I was alive, and back with my husband and boys."

In 1945 Ogden Miller left Yale to become headmaster of the Gunnery School, in Washington, Connecticut. He died in 1979 at age 78, but Anne Miller still lives in this picture-postcard New England town, surrounded by her memories and photographs of her six grandchildren. Despite the removal of a malformed kidney, and a few bouts of minor illnesses, she remains a picture of health—healthy enough to drive herself to Cape Cod for her annual summer vacation, to go to Texas for a grandson's wedding, to show a visitor around the Washington town green.

Three months after Anne Miller's recovery, Sir Alexander Fleming came to New Haven and sought her out. The picture of their meeting still occupies a place of honor in her home (below). "He was a small man, very courtly with big, soulful eyes," she recalls. "I shook his hand and thanked him for what he had done. He looked at me with those big eyes and said, 'Thank you, Mrs. Miller, you are my most important patient.' "

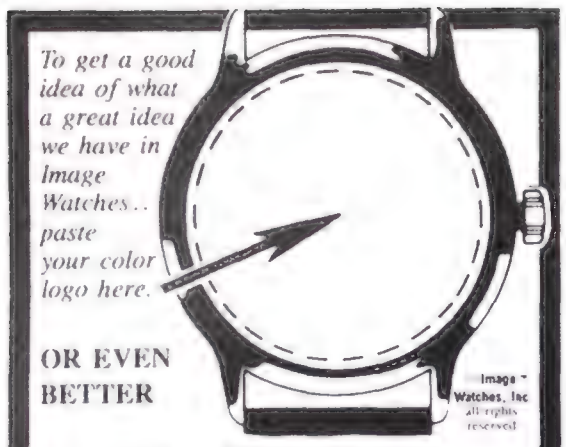
Anne Miller had never been Fleming's patient, of course, but when you have miraculously been given back your life, you are not one to quibble about details.

A photograph that hangs in her home shows Miller meeting with Fleming (right) and Yale medical school dean Francis Blake.

Now our famous Post-it™ brand notes are even faster to use. And easier to find on your desk, too. Because they're delivered to you one at a time from our handy new "Post-it" Pop-Up note dispenser. Available in 2 sizes and 4 colors, along with our special fan-folded notes, at your local office, school or art supply dealer.

3M Commercial Office Supply Division. "Post-it" is a trademark of 3M. © 1990, 3M

3M



To get a good idea of what a great idea we have in Image Watches.. paste your color logo here.

OR EVEN BETTER

Image Watches, Inc all rights reserved

Send us your color logo

(Any size letterhead, photo, brochure, artwork)

along with U.S. **$16.50 ea.** (Tax, Shipping) included **and we'll rush you a personalized working *quartz* watch sample as our convincer!**

Your company logo in full color is the dial of a handsome wristwatch. Gold plated case, genuine leather band, battery powered quartz movement with 1 year limited warranty. Men's and women's sizes. Remarkably inexpensive even in **small quantities.**

Limit: 2 samples per company @ $16.50 each

IMAGE™ WATCHES, INC.

Suite 302, 400 Atlantic Blvd.
Monterey Park, CA 91754 • (213) 726-8050
Attn: Mr. Jefferson
9am-5pm Mon.-Fri., Pacific Coast Time

Logo Watch Leader for over 10 Years

Unconditional Money Back Guarantee

TALL & BIG MEN

Send for this FREE Catalog!

- SHIRTS UP TO 24" NECK & 38" SLEEVE.
- JACKETS & COATS TO SIZE 6XL.
- PANTS UP TO 72" WAIST & 38" INSEAM.
- SHOES UP TO SIZE 16EEE.

100% SATISFACTION GUARANTEED!

Send Me THE KING-SIZE CO. Catalog!

Name_____

Address _____

City_____ State____ Zip_____

I am interested in Shoes☐ Apparel☐ Both☐

2071

THE King-Size CO.

P.O. BOX 9115 • HINGHAM MA 02043-9115

Book reviews

Cowboys of the Americas
Richard W. Slatta
Yale University Press, $35

"I see by your outfit that you are a cowboy." So go the words of the well-known song "The Cowboy's Lament." But whose cowboy? What country's? For the sake of historical accuracy, only a closer look at the cowboy's outfit can give us the answer.

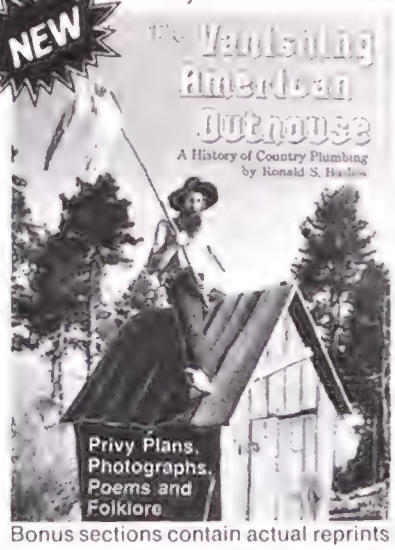
Richard Slatta has done our research for us in this study of the cowboys of North and South America and Hawaii—their origins, character, equipment, work habits, lifestyle and, perhaps most tellingly, the centuries-long impact on history of their myth-bound culture. Both above and below the Equator, Slatta follows his cowboys onto the range during the week and into town on Saturday night. He tells the story of these cowhands more comprehensively than the novels of Zane Grey or the old Hopalong Cassidy movies could ever hope to.

If our cowboy's outfit consisted of sandals or bare feet and a flour-sack apron, chances are he was a Chilean *huaso*, while his comrade to the east, the Argentine *gaucho*, would more likely be decked out in a colorful poncho, voluminous trousers, a long knife and long clanking spurs. A shoeless cowpoke dressed in knee breeches and wearing a knife at his belt and the ubiquitous poncho over his shoulders would announce himself as the Venezuelan *llanero*, whereas the Mexican *vaquero* fancied a short jacket, brilliantly trimmed bell-bottom pantaloons, broad-brimmed sombrero and his beloved serape.

The Hawaiian *paniolo* retained the sombrero, albeit made from local mate-

Recently reviewed in N.Y. Times.

NEW


The Vanishing American Outhouse
A History of Country Plumbing
by Ronald S. Harlow
Privy Plans, Photographs, Poems and Folklore

PRIVY PLANS

New Book, over 200 photos and plan drawings of American Outhouses constructed between 1830 and 1940. Big, colorful volume, 144 pgs. 9x12, packed full of serious history and country humor too.

Bonus sections contain actual reprints of U.S. Government pamphlets on outhouse construction and a collection of rare privy postcards, in full color. Prize winning photos and large type size make this book a great gift for the over-fifty crowd. Order a copy for your bathroom bookshelf today. $15.95 plus $2.00 postag

WINDMILL PUBLISHING COMPANY
2147 Windmill View Rd., Dep S1 El Cajon, CA 92020

SUNDIALS
WEATHERVANES
WEATHER INSTRUMENTS

Free Catalog

Wind & Weather

P. O. BOX 2320-SM, Mendocino, CA 95460 (707) 937-0323

For Back Relief and Total Relaxation

Our recliner is like no other chair in the world!

Adjustable from upright to a fully horizontal position

Office Model Available

BackSaver™ **FREE 12 page catalog 1-800-251-2225 or write**

53 Jeffrey Avenue, Dept. SMH, Holliston, MA 01746

Creating Nature Awareness

BARN OWL®
Pin shown
⅔ actual size. Limited Edition.

Sterling Silver/Sapphires	$175
14K Gold/Rubies	$825
18K Gold/Emeralds	$1,025

Carsons

722 Bay Street • Beaufort, SC 29902
ORDER TOLL FREE 1-800-763-0102
(MC, VISA, AMEX) Send $3 for Full Color Catalog

12 New Ways To Improve The Picture On Your TV.

Introducing PBS Home Video.

If the same old video choices just don't drive you to the video store anymore, get ready for PBS Home Video. The programs that challenge your mind and stimulate your senses are coming home for you to watch again and again. Whenever you want.

All your favorites like *This Old House, The Frugal Gourmet, American Playhouse* and our fascinating *Nature* series. Plus, *Newton's Apple* for the kids. And the ever popular Bill Moyers and Dr. Leo Buscaglia.

PBS HOME VIDEO
Enriching Your World

Each tape is only $19.95 and these twelve are just for starters. Dozens more are coming soon.

So, if you're running out of video choices, run down to your favorite store and pick up the critics' choice. PBS Home Video.

Available now wherever you buy videos. Or, call **1-800-538-5856** for your nearest authorized PBS Home Video dealer. You can even order directly by credit card.

EXCLUSIVELY DISTRIBUTED BY PACIFIC ARTS VIDEO. QUALITY VIDEO PROGRAMMING SINCE 1974.

Available at video stores everywhere including:

BLOCKBUSTER VIDEO
WOW! What a Difference™

rials, for his outfit but decorated it with richly hued shells and feathers, then added a flowered lei around his hat or neck because "the girls all look at you when you wear a lei!" Not even thousands of miles of ocean could dampen a true cowboy's desire to please a lady. For their part, the U.S. and Canadian cowboys dressed alike—flannel shirt, neckerchief, snug jeans, high-heeled boots and some sort of range-ready, all-purpose felt hat.

If a distinctive outfit served to set the cowboy apart from others in his society, it still did not define his character. Was he a paragon of national virtue, as some believed, or a lazy, backward, low-class drifter? The cowboy of the Americas has rarely, if ever, enjoyed consensus.

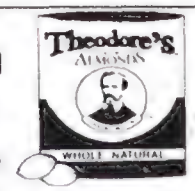
Perhaps the key word here is "Americas," plural form, which keeps Slatta's book from becoming simply another study of our own Western cowpoke. His approach to his subject may be compared to the filming of a movie, his camera zooming in on the horsemen for closeups of appearance and lifestyle, then drawing back for the larger view of hemisphere and history.

The original cowboy, he explains, was primarily a wild-cattle hunter who evolved into a horse-borne herder. In terms of "original equipment" the cowboy owes everything to Spain, since both the cow and the horse came here from there. Records tell of cattle appearing on the Isthmus of Panama in 1510, and Cortés is known to have taken horses into Mexico a decade later. Ponce de León (searching for the Foun-

Mexican vaquero's leather outfit served as protection from cactus and brush.

YOUTH FROM MARATHON (350BC)
While you enjoy his beauty, he speaks of you to your friends. Found under the sea. Now in The National Museum, Athens. This 10" Greek reproduction is made from chloride magnesia, used by the ancient Greeks. Beautiful bronze-like appearance. Marble base. $112 ppd. Check VISA, MC. Unconditional guarantee. **112 page art-book color catalog of more than 300 items $6. Order now and select unforgettable Christmas gifts.**
ELEGANZA LTD. *Importers of Fine Statuary*
Magnolia Village • 3217 W. Smith #2113
Seattle, WA 98199 • 206/283-0609

Save $5.00 on California Almonds



That's right. For a limited time you can save $5.00 on farm-fresh, shelled California Almonds from Theodore's Almonds. Available in three flavors: Dry-Roasted Hickory, Whole Natural, or Dry-Roasted Lightly Salted. Send check or money order, Visa, MC or AE* with Exp. Date to:

4 lb. Can $14.95 del'd.* (Reg. $19.95)

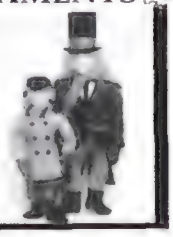
Theodore's California Almonds
P.O. Box 150, Dept. C
Ripon, CA 95366

Credit Card Orders Call 1-800-829-6887
*del'd. in cont. U.S. For AK & HI add $7.50
Money Back Guarantee (offer expires 2/1/91)

GLADYS BOALT© ORNAMENTS

Soft sculpture completely HANDCRAFTED in the USA. Exquisite detail. Storybook characters and traditional themes

For a 32 page catalogue, send $3 to
WEED HOUSE
1415 High Ridge Rd.
Stamford, CT 06903
(203) 322-7246


Scrooge & Tiny Tim

MYSTICA

Mystica & Co., Inc.
1265 Birchrun Rd.
Chester Springs, PA
19425
215 469 0535
FAX: 215 469 0999

Lizard crafted in solid fine silver, limited edition of 680.

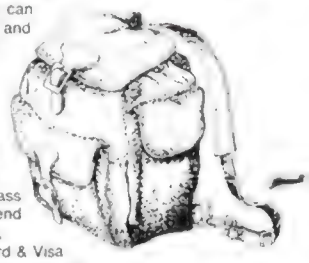
Truly... Scientific Art
EcoSphere®

A carefree aquarium of sealed glass. Developed by NASA using live shrimp, algae, water, and air in bioregenerative balance. Base and replacement policy included.
Delivered:
$80- $250.

Ecosphere Associates, LTD.
9000 N. Oracle, Ste. C4, Tucson, AZ 85704
1-800-729-9870

LEATHER BACKPACK RUGGED **ONLY $29.95**

HISTORIC EXPLORERS of America required backpacks that were tough! Now **YOU** can enjoy the richness (smell that leather) and durability of soft, 100% leather in this modern version of the famous trail pack of yesteryear. Rich tan color. Black metal hardware. Roomy 14" x 17" x 6" cargo compartment plus 3 handy expandable outside pockets. Two 2" wide adjustable shoulder straps. Excellant bookbag. Offers 1,000 uses for any outdoorsman and a touch of class for those "long hours on the trail." Send $29.95 + $3.95 delivery. Use 30 days, money back if not pleased. MasterCard & Visa accepted (phone 312-445-6166). C.O.D. require $5 deposit. Order today! Midwest Company, Dept. L-2219, 9043 S. Western Ave., Chicago, Ill. 60620. Special 2 packs for $58.90 postpaid. Our 54th year.



BONUS: ORDER NOW RECEIVE A COMPASS FREE

Once! **America's Largest Fine Watch and Jewelry Discounters**

SAVES YOU UP TO 50%
ROLEX • AUDEMARS • PATEK
BAUME & MERCIER • CARTIER, ETC.
DIAMONDS & PEARLS

815 Connecticut Ave. N.W.
Washington, D.C 20006
202/331-0671 800/654-7184

MARCUS & CO.
ELEGANT PRICE CUTTERS SINCE 1971
Free Shop at Home Catalogue

Handsome New BIKEPLATES
Beautify any bicycle and **stop thefts!** Our rounded bikeplates have a new adhesive-bond back, lock tight anywhere on the bike's frame. Solid brass with silver finish, 1" x 2". Expertly engraved any way you choose (limit 50 letters). Full price $5.00 each. Satisfaction guaranteed or money back. We ship in 2 days. Mail orders direct to **Elgin Engraving Co.**, 522 Stevens Ct., Dept. 7, Dundee, Illinois 60118.

THIS BIKE BELONGS TO
CHRIS ROGERS

TOY SOLDIERS
FINEST MILITARY MINIATURES
Britains, Trophy, Tradition,
Steadfast, Stadden, Alymer, etc.
COLOR CATALOG $1.00
Armchair General, Ltd.®
12747 Olive Blvd., St. Louis, MO 63141
We buy old toy soldiers

"Bargain Books"
Publishers' overstocks, remainders, imports—over 4,000 titles at up to 80% savings in our **FREE CATALOG!** Biography, History, Art, Fiction, Nature, Cooking, Gardening, Politics, Travel, Sports, Crafts, Military History—something for everyone, including about 800 new titles monthly. Write:
Hamilton Box 15-510, Falls Village CT 06031

12-DAY CRUISES FROM $99/DAY
Belize · Great Barrier Reef · Guatemala · Jungle River · Mayan Ruins · Florida Everglades · Dry Tortugas · Virgin Islands · Caicos · Columbus Discovery · RI-FL Intracoastal Nov & May · Canada Saguenay via Erie Canal Summer
800-556-7450 For Free Brochure
American Canadian Caribbean Line, Inc.

A MODERN JOURNAL OF ANCIENT EGYPT
Subscribe Today to Quarterly
K·M·T
Art · Archaeology · History · Architecture
Interviews · Reviews · Much More!
4 Issues $32 by Check/Money Order
KMT
1531 GOLDEN GATE AVE., S.F., CA 94115

RUSSIAN LACQUER BOXES
PLEASE SEND FOR OUR 60 PAGE FULL COLOR CATALOG - $3
LIGHT OPERA GALLERY
174 GRANT AVE
SAN FRANCISCO, CA 94108
415-956-9866

ALASKA WILDLAND ADVENTURES
Natural History Safaris
7, 10, & 12 days
Denali Park
Kenai Refuge
Seacoast Glaciers
"Why sightsee Alaska when you can experience it!"
1-800-334-8730 P.O. Box 259, Trout Lake, WA 98650

CAT BRACELET
F-17, sterling: $100 ppd. 14K: $800 ppd.
9 sitting cats form the links of this bracelet. A cat lover's delight.
Gift boxed, satisfaction guar.
MC, VISA, AMEX, ck or M.O.
1-800-67-TORYS M-F, 9-5, EST.
Catalog upon request.
7½" long
TORYS
106 Washington St., Dept. S, Marblehead, MA 01945

tain of Youth and perhaps anticipating a lengthy stay) transported both horses and cattle to Florida in 1521. Coronado and his men drove a herd of 500 cattle into the Southwest 20 years later.

Cattle first reached Hawaii in 1793 as a gift to King Kamehameha I, and his grandson imported Mexican vaqueros in 1832 to instruct his people in ranching skills. The Canadian cattle frontier lacked the uniqueness of Hawaii's, as well as the violence and drama of that of the continental United States, yet the vast grass ranges of Alberta had developed a flourishing cowboy culture by the final decade of the 19th century.

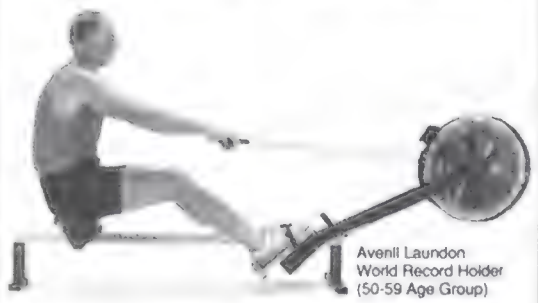
What these horsemen shared, regardless of country, was a bare-bones life. They did a hard job in fickle weather for abominably low pay. "Ranchers paid top money for breeding bulls," Slatta tells us, "and bottom dollar for cowboys." The range riders had little opportunity for upward mobility—most owned their saddle and clothes but not their horse—and trailing dogies was certainly not the path to riches. There were no union benefits and no lining up in town for unemployment checks. In many South American countries the cowboy became a social outcast.

Cowboys everywhere were accomplished pranksters, perhaps more so than any other class of workmen. I have personal recollections of grizzled ranch hands in the Judith Basin country of Montana tossing a dried cow chip onto a buddy's bunk and announcing, "I found your hat!"

It's part of the mythology that cowboys broke into song around the campfire at the end of the day (remember the Sons of the Pioneers?); mostly they talked till they fell asleep. It was not unusual, though, for night riders to sing to calm restless cattle. It will surprise many readers to learn that the Hawaiian paniolo included yodeling in his music as early as 1890, although it wasn't until the 1920s that it was popularized on the mainland by Western singing stars.

The Indian wars in this country have been sensationalized by countless pulp novels and B movies, but the real cowboy realized that the Indian was his main competitor and therefore his enemy. The story is told in New Mexico, sometimes with a straight face, that an Indian chief once asked a cavalry general for a cannon. Fearing the Indians would use the cannon to kill his sol-

Discover Rowing
FOR A LIFETIME OF FITNESS.



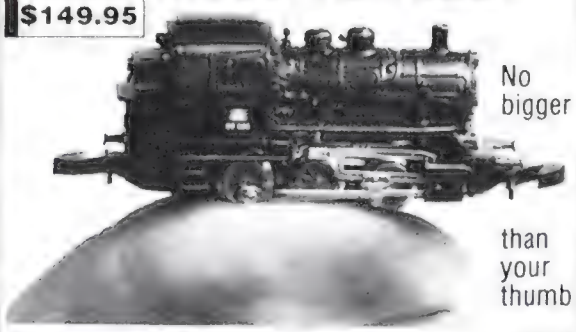
Averill Laundon
World Record Holder
(50-59 Age Group)

Designed by Olympic oarsmen, The Concept II Rowing Ergometer exercises your entire body. The smooth rhythmic motion of rowing is an ideal form of cross training and an excellent way to maintain fitness.

The Electronic Performance Monitor will give you instant, accurate feedback of your power output in either watts, distance rowed or calories while also displaying elapsed time and stroke rate.

FOR BROCHURE CALL TOLL FREE
1-800-245-5676
OR WRITE:
The Concept II Rowing Ergometer
CONCEPT II, INC. RR1 BOX 1100-841
MORRISVILLE, VT 05661 FAX (802)888-4791

"All aboard the world's smallest operating model railroad."
was $169.00
$149.95



No bigger than your thumb

Measuring only 2" long. A break-through in precision miniaturization by Marklin. (Actual size.)
The distinctive Mini-Train cannot be compared to any other small-scale model railroad gear you have seen. Each Mini-Train represents a masterpiece in miniature, incorporating a complete model railroad system. Imagine a complete operating railroad so small you can fit an entire layout on a corner of your desk. The set consists of a tank locomotive of die-cast zinc, low sided freight car, and box car, with 16" x 20" track, including A.C. Power-Pack and 200-pg. color catalog. Priced at $149.95* payable in convenient monthly credit card payments

SATISFACTION GUARANTEED
BEACON SCIENTIFIC
Dept. F-25, Route 23, P.O. Pox 238, Newfoundland, N.J. 07435

Payment Plan:	Single Payment	3 Payments
☐ Send ____ Mini-Trains	☐ $149.95*	☐ $49.99*

☐ MasterCard ☐ Visa ☐ American Express
Charge # _____ Exp. date _____
For Fastest Service Call Toll Free (800) 972-5858
Name _____
Address _____
☐ I prefer not to use a credit card and will pay by check. Enclosed is my check for $149.95 plus $6.00 shipping/handling.
☐ Send your complete 200-page color Mini-Train catalog at $10.00 which I understand I may apply to future Mini-Train orders.
*Plus $6.00 shipping/handling. (NJ residents add sales tax.) If 3 payment plan is chosen these charges will be billed with first payment. ©Beacon Scientific 1990

diers, the general refused the request. "Can kill soldiers with sticks," replied the chief indignantly; "want cannon to kill cowboys!"

There still are ranch hands at work in Hawaii and on the American continents, but developments late in the past century—notably farmers and fences—brought traditional cowboy life and open-range ranching to an end. As the historical cowboy passed into eclipse, Slatta tells us, "his fictional successor was born in literature, drama, and mythology." Mexico often elevated the vaquero to a Joaquin Murieta-type folk hero, a performer of daring deeds. The gaucho of Argentina was rehabilitated into a national virtue, and in this country we scarcely have another institution so relentlessly supported by myth and romantic legend as that of the cowboy.

This is an outstanding work. Abundantly illustrated, superbly organized and with footnotes enough to satisfy even the most insatiate armchair researcher, Slatta's book is part of the Yale Western Americana Series. It is factual without being pedantic, yet has just enough wistfulness to make us dream, as in the words of another beloved old song, "Those are the times that old memories play,/Make me a cowboy again for a day."

William Dieter
Denver novelist

Disappearing Through the Skylight: Culture and Technology in the Twentieth Century
O. B. Hardison jr.
Viking, $22.95

O. B. Hardison, University Professor of English at Georgetown University in Washington, D.C., knew a great deal about the disappearance of many familiar ideas, philosophies and objects that have made up our culture in the past. In this timely book Hardison, a formidable scholar, educator, author and former head of Washington's Folger Library, who died last August, explained what he saw happening to some of our most cherished ideas and precepts.

It makes for disturbing reading, especially for those who hold to conservative ideas. Essentially, he believed, preservation of ideas and traditions fails to keep up with rapidly changing times. Modern science and technology are given the credit for this fact.

"This book," Hardison explained, "is about the ways culture has changed in the past century, changing the identities of all those born into it. Its metaphor for the effect of change on culture is 'disappearance.'" His choice of objects for discussion, among all those things disappearing through the skylight, provides a cross section of modern culture. "Nature, history, language, and art are parts of a wonderfully intricate mobile: touch one and the rest tremble and change position in sympathy."

Drawing on sources as diverse as Saint Augustine and J.D.S. Haldane, *Star Wars* and *Paradise Lost*, Hardison's book describes the new world wrought by modern thought and technology, especially in the form of computers, and how it has replaced the familiar.

Fourth-century converts to Christianity could find no terms in their everyday language to express what they were experiencing; they resorted to "paradoxes and impossibilities"—becoming a little child, seeing through a glass darkly, ris-

ing from the dead. To their fellows who had not "crossed the barrier between pagan and Christian culture" this was simply nonsense. Similarly, the language the 20th century grew up with is not adequate to describe the world of computers, quarks, fractal geometry and quantum mechanics. Our old comfortable language is disappearing.

Computer art, capable of multiple replication, is "holistic in its simultaneous use of image, sound, and text, and is often kinetic." What would Leonardo have made of this?

In Washington, D.C., L'Enfant's grand design, the city's domes and columns, even the choice of a hill and its new name, Capitol Hill (it used to be just plain Jenkins Hill), kept us in touch with Greece and Rome and, by implication, with classical ideas. Today's architecture seems bent on flinging us into the future.

Where Charles Darwin saw penguins and tortoises, we are looking at microphotographs of cells. Seeing nature in this form, Hardison suggested, dehumanizes it. "Things no longer look like things. The images that the instruments produce have more kinship with each other than with what they 'are.'" An infrared photograph of a landscape may resemble an Impressionist painting. A cancer cell may look like abstract art. We have to learn a new way of seeing nature.

"The universalizing process of technology has touched every facet of culture. As this has happened, the sense of individuality has inevitably faded." Man himself seems in danger of being replaced by robots. We can envision mechanical men that think, even experience emotion. Hardison cited an episode of *Twilight Zone* in which the protagonist injures his arm, and upon looking down is amazed to see not flesh and blood but circuitry. He is a robot but has always thought he was human. We can easily imagine this as our future.

No review can do justice to this book and the range of Hardison's erudition; every page is thought-provoking and often disturbing—especially to those who dislike many aspects of late 20th-century civilization. What is our role, then, in this rapidly changing drama? We can sit in our homes and bemoan the passing of traditions and culture, step outside and try to reverse those processes we dislike the most, or eagerly embrace these strange ideas as part of a new—not American, but world—culture.

W. S. Lyon
Consultant
Oak Ridge National Laboratory

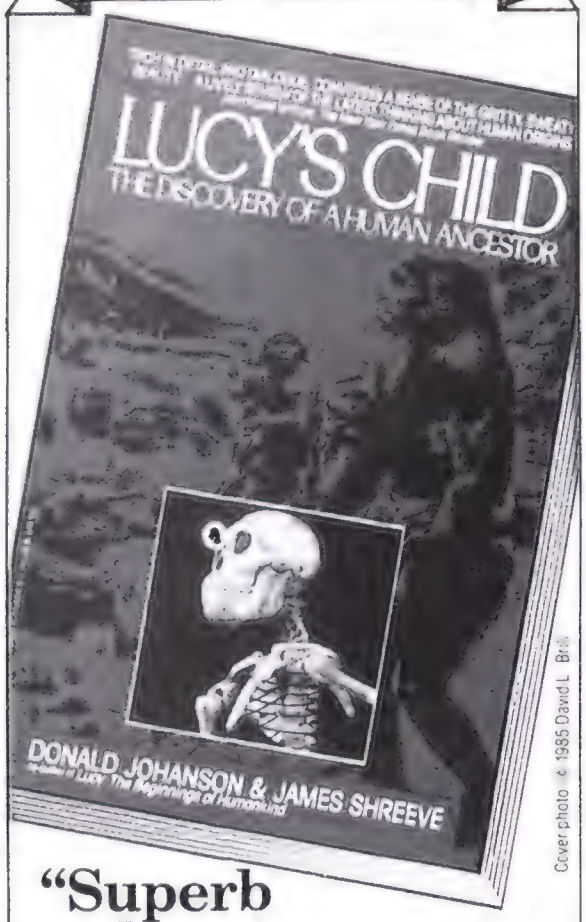
As Thousands Cheer:
The Life of Irving Berlin
Laurence Bergreen
Viking, $24.95

The songwriter as celebrity—it's a phenomenon difficult to imagine in this era of performer-worship. (Who besides devotees knew, say, the name Carole King until that veteran composer of rock hits made a smashing album, *Tapestry*, as a singer of her own material?) Irving Berlin had too thin a voice to make it as a singer. He couldn't play much piano, either. Yet arguably he was the dominant and best-known figure in American music during the first half of the 20th century.

He courted celebrity early in his career, and his interfaith marriage to a

LINCOLN
What a luxury car should be.
LINCOLN TOWN CAR. NOW, THE ROOMIEST CAR IN THE WORLD HOLDS A NEW V8 ENGINE FOR
MORE POWER AND AN EVEN QUIETER RIDE. 1 800 446-8888

Now in paperback



Cover photo © 1985 David L. Brill

"Superb adventure...
the ultimate triumph of an expedition that unearths something wonderful about the origins of humanity."
—Peter Gorner, *Chicago Tribune*
AVON TRADE PAPERBACKS
The Hearst Corporation

RARE U.S. ERROR STAMP

Only $62.50 (framed $75.00)

Talk about rarity! ... Only **1 in 10,000,000** stamps printed today is an error stamp. Issued in 1954 (**36 years old**), this stamp is a portrait of Thomas Jefferson, president, botanist, architect, inventor, musician, designer, farmer and teacher, whom many historians consider the most gifted intellectually of our founding fathers.

Priced as shown **in holder $62.50**, or specially mounted **in a brass 5"x7" frame $75.00 postpaid**. Pricelist showing other error stamps framed, in collections, or in full sheets $2.00 (refundable with first order). 30 day money back guarantee. To order by credit card, call 1-800-446-8378, or send check to: Potomac Error Stamps, 8520 Atwell Road, Potomac, MD 20584. **We guarantee Christmas delivery on all orders made by December 15th.**

wealthy socialite drew comment at a time when the American melting pot had barely begun to simmer. Late in his long life, he became famous for reclusiveness, like Garbo (who lived only a few blocks from him in midtown Manhattan). But none of this would have mattered except for his genius and the prominence of tunesmiths before the advent of radio and records, when live performance and sheet music were the chief modes of musical expression. In *As Thousands Cheer*, the industrious Laurence Bergreen recounts occasions when performers had to deliver encores of a new Berlin song by the dozen. Unsure about the prospects of hearing the piece again after leaving the theater, the audience gobbled helping after helping while it was in front of them.

As for Berlin's genius, Bergreen may have summed it up as well as anyone who has ever tried. On first hearing, his best songs—"God Bless America," "White Christmas" and others—seemed "always to have been there, just beneath the surface of the national consciousness, waiting for Berlin to give [them] final form." Even so, he never shed his immigrant's sense of not fitting in.

Born Israel Baline to Orthodox Jewish parents in Russia, he was 5 when the family entered its adoptive country through Ellis Island in 1893. He was an indifferent scholar but a passable singer, and his father's work as a cantor left him smitten by the "life-affirming qualities of music and song."

After leaving school, he parlayed a job as a singing waiter into employment with a music publishing house. His early efforts at composition derived from European models, but soon he allied himself with the movement to produce genuinely American music. He couldn't read or write music; he relied on copyists and arrangers to do justice to the melodies he picked out on his piano. His first song that the public couldn't get enough of was "Alexander's Ragtime Band."

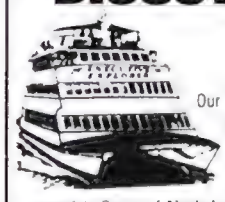
His homegrown influences included Stephen Foster and turn-of-the-century black ragtime artists, whose syncopated rhythms propel songs like "Alexander's Ragtime Band" and the incomparable "Puttin' On the Ritz." Puccini sought him out as a collaborator, and occasionally Berlin talked about writing an opera. But his gifts did not extend to narrative; his full-fledged musicals (*Annie Get Your Gun, Call Me Madame*)

Unique Holiday Gifts
Fossils of the Smithsonian Institution® reproduced by Skullduggery

Claw of the *Allosaurus*
Skull of the *Stegosaurus*

Send for your catalog of Natural History items.
Skullduggery, Inc.
621 South B Street
Department SKO
Tustin, CA 92680
or call (800) 336-7745

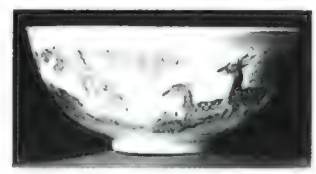
DISCOVER THE BEST OF ALASKA!



Our 7-Day/6-Night CruiseTours include tidewater and alpine **glaciers**, in **Glacier Bay National Park**; incredible **wildlife**; spectacular **scenery**; Fascinating Indian, Russian and Gold Rush **history** and **cultures**; entertainment and shopping, & most complete Cruise of **Alaska's entire Inside Passage** on our small, **luxury-yacht cruiseship, the *Executive Explorer*** providing best close-up viewing. For Independent Travelers, we have 1-, 2- & 3-Day Glacier Bay CruiseTours from Juneau, Skagway & Haines. For a brochure call Toll-free 1-800-622-2042, see a Travel Agent or write

Glacier Bay™
TOURS AND CRUISES
523 Pine Street, Suite 203, Dept. L65
Seattle, WA 98101

Eggshell Porcelain
Hand Painted
Finest Quality
Porcelain from China



Eisler Porcelain, Box 200 R, Dept. S. *Free Catalog*
R.D. 3, Slippery Rock, PA 16057 1-800-451-0922

LEATHER BOOK BAG **ONLY $179.**
Call 1-800-999-1920

Black onyx and sterling silver
18" necklace of 10mm black onyx beads, 22mm sterling silver puffed heart and 10mm sterling silver ball clasp. N-1 $75. 14k gold heart and clasp $150. Ins., Ppd

Smaller than actual size

LDL Fine Jewelry
Mail Order Div.,P.O. Box 633, Marblehead, MA 01945
Satisfaction guaranteed. Phone, FAX 24 hrs.
Phone: 1-800-874-5593 FAX: 617-631-8702
MC, VISA, check or M.O. Please include expiration date, and phone #. Order by Dec. 15 for Christmas delivery.

fall short of the thematic unity found in Jerome Kern's *Show Boat* and Richard Rodgers and Oscar Hammerstein's *South Pacific*. What Berlin's musicals do not lack is memorable songs.

Even these stopped coming, however, sometime in the early 1950s. It wasn't so much that the wellsprings of Berlin's creativity dried up as that his audience splintered, and tastemakers were hawking new kinds of music. Berlin's insecurities now took up permanent residence in his psyche. He hated being old; he "felt himself to be a young man unaccountably trapped in an old man's frail body." He was devastated by the deaths of old friends, especially that of Fred Astaire.

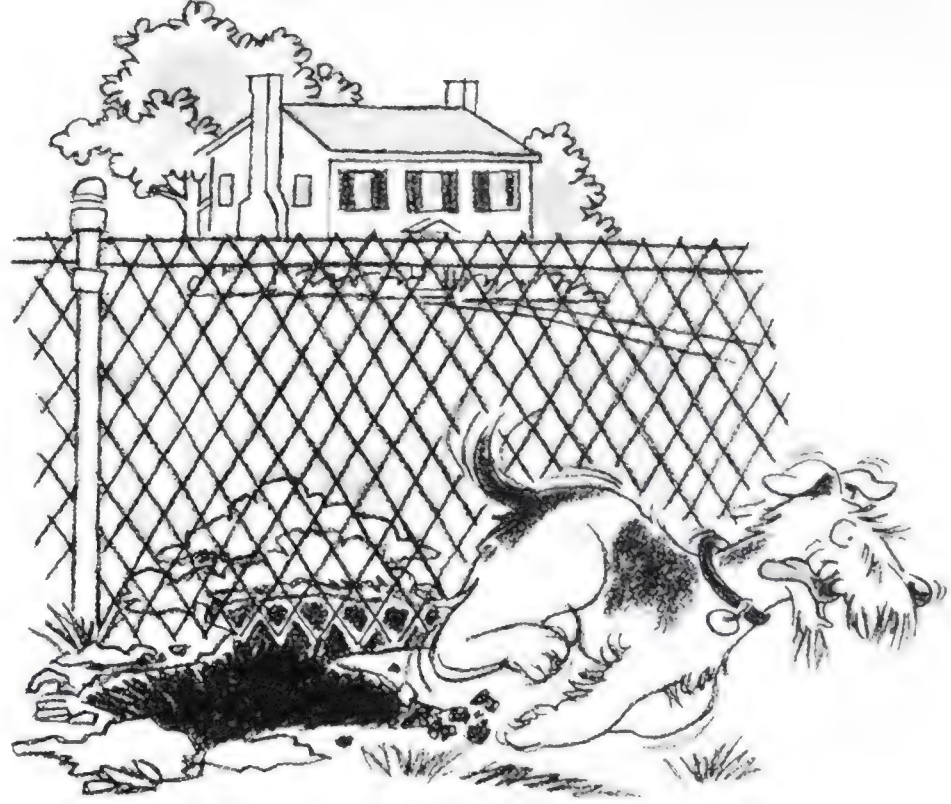
With deft, economical strokes Bergreen sketches a portrait of a late-blooming misanthrope, living decades beyond his professional usefulness, able to find meaning only in exerting the utmost possible control over his 1,500 published songs.

These bitter last years of abusive phone calls to anyone who dared tamper with a Berlin lyric and of no-shows at galas in his honor finally came to an end in 1989, when he died at age 101. In Laurence Bergreen's compelling interpretation, nothing was so quintessentially American about Irving Berlin as a suspicion he could never quash: that for all his hits and his millions, he wasn't quite good enough.

Dennis Drabelle
Washington writer

Picture credits

Cover Museum of Modern Art; 25 Orion Pictures; 26 Smithsonian Institution/Lockheed Corporation; 36 George Junne; 40-53 Gail Mooney/Kelly-Mooney Photography; 54-61 Evelyn Cameron; 64, 65 Modenesi Studios; 66, 67 Erich Lessing/Magnum; 68-72 National Gallery of Art; 73 Art Resource; 74-79 Modenesi Studios; 80 Metropolitan Museum of Art; 81 National Gallery of Art; 84-96 Peter Menzel; 98-103 Jeffrey L. Rotman; 106-15 John Huehnergarth; 118-33 David Beatty/Susan Griggs Agency except 120-21 Bowring Cartographic; 138-42 Museum of Modern Art; 144 Henry Groskinsky, Museum of Modern Art; 146-47 Museum of Modern Art; 148 Mark Ferri; 149 Museum of Modern Art; 154 Peter Tompkins; 155 Granger Collection; 156 London School of Economics; 158-60 Granger Collection; 163 Richard Averill Smith/Peter Tompkins; 164 Peter Tompkins; 165 London School of Economics; 166-68 Peter Tompkins; 173 Julian Nieman/Susan Griggs Agency/Dr. Norman Heatley, Bettmann Archive; 174 Julian Nieman/Dr. Norman Heatley, Popperfoto; 175 Oxford University/William Dunn School of Pathology; 177 Dr. Norman Heatley; 179 Yale Historical Library; 180 Oxford University/William Dunn School of Pathology; 182 UPI/Bettmann; 183 Julian Nieman; 185 Robert Benson; 187 Robert Benson/Mrs. Ogden Miller; 202 Cooper Hewitt Museum; 206 John Cymerman



Another reason to get Invisible Fencing.

Give your dog freedom and safety.
Invisible Fencing® is veterinarian approved
and comes with a money-back guarantee.
To learn all the other reasons,
call for a free brochure.

1-800-635-8300

© 1990 Invisible Fence Company, Inc

INVISIBLE FENCING®

BOTTLENOSE DOLPHIN

Elizabeth Allen Tuttle, noted artist and jewelry designer, has miraculously captured the graceful ballet of the Dolphin. The solid sterling silver Dolphin comes complete with a 20" sterling silver chain, polishing cloth, and leather pouch. Length: 42mm $95. plus $2.50 shipping. **The Dolphin will be shipped in 24 hours. Visa/MC/AmEx/Check.** © Elizabeth Allen Tuttle

MAIN GEM 9-11 Sharp's Wharf, Camden, Maine 04843
1-800-356-6310 IN MAINE 236-4854

MEN'S WIDE SHOES

EE-EEEEEE, SIZES 5-13
Extra width for men who need it.
Excellent variety, styling and
quality. Send for FREE
CATALOG.

The Widest Selection of the Widest Shoes Anywhere!
HITCHCOCK SHOES, INC.
Dept.21J Hingham, MA 02043

Colorful & Adorable, 100% Cotton
CHI CHI BAMBINO Children's Overalls
Handwoven in Guatemala, available in all the colors of the rainbow, sizes 12 mos. thru 4 toddler (infant sizes w/snaps). Pay by check or VISA / MC. To order by mail or for more info call: (215) 922-2804
AGAPE Import-Export, Inc. or FAX us at:
1116 Pine Street (215) 922-1210
Phila. PA 19107

only $15 a pair or 2 for $25 plus $... for shipping & handling

Introducing a **NEW ROBE**
so unique that Patent is Pending for the
TERRY-T-ROBE™
for MEN & LADIES
featuring

- **NEW COMFORT** for all seasons and many uses
- **NO BELT** to bind/adjust
- **NO OPEN FRONT**—never pulls apart
- **LESS BULK**—rich terry is where it can best serve without unneeded overlap
- **100% COTTON** with terry loops on both sides for greatest absorbency (not possible with lighter weight robes)
- **EXCEPTIONAL VALUE**—Luxurious robe with below the knee length (48") and two full pockets. Quality made in U.S.A.

We have been unable to find any robe at any price that can duplicate the advantages of our TERRY-T-ROBE™. Its new fabrication and design skillfully gives just the right bottom flare with neat appearance, easy on-off and maximum comfort WITHOUT the belt problem of too tight—too loose and constant overlap adjustments.

COLOR CHOICE: Snow white or soft medium blue. **SIZES** to fit men & ladies from 100-250 lbs. Just give approx. height & weight for each robe AND specify for MAN or LADY. We'll specially select the best size.

SPECIAL TIME LIMITED PRICE — Only $39.50
2 for just $68.80 (Save over $10)
GREAT FOR HIS & HER GIFTING
Satisfaction Guaranteed—ORDER NOW while prices include all postage/handling!
WITTMANN TEXTILES, Dept. 421
Hobe Sound, FL 33475 ***(Ship to FLA add 6% tax)***
Natural Fiber Specialists Since 1955

Additional reading

Arthur County (p. 40)

History & Ecology: Studies of the Grassland by James C. Malin, University of Nebraska Press, 1984

Rural Planning and Development in the United States by Mark Lapping, Thomas Daniels and John Keller, Guilford Press (New York), 1989

The Frontier in American History by Frederick Jackson Turner, Holt, Rinehart and Winston, 1962

Titian (p. 64)

Titian, Prince of Painters (exhibition catalog), Marsilio Editori (Venice), 1990

Venetian Art from Bellini to Titian by Johannes Wilde, Clarendon Press (Oxford), 1988

Venice: The Biography of a City by Christopher Hibbert, W. W. Norton and Company, 1989

Micromachines (p. 84)

"Electric Micromotors: A Status Report" by J. H. Lang, *Proceedings on the International Conference on Electric Micromachines*, edited by Thomas A. Lipo, University of Wisconsin, 1990

Fish skins (p. 98)

Red Sea Reef Fishes by John E. Randall, Immel Publishing (London), 1983

Red Sea Diver's Guide by Shlomo Cohen, Red Sea Divers Publications Ltd. (Tel Aviv, Israel), 1975

H. W. Fowler (p. 106)

The Fowlers: Their Achievements in Lexicography and Grammar by Robert W. Burchfield, English Association (London), 1979

H. W. Fowler by G. G. Coulton, Oxford University Press, 1934

Great Art for All Who Love It!

On-canvas replicas that recreate exactly the colors, details and textures of original oil painting Masterpieces.

Our replicas are the compact discs of fine art reproductions.

See for yourself!

Our 92-page **full color** Catalogue of over 370 ***elegantly framed*** Portraits, Impressionists, Hunt Scenes and more - ***$5.00.***

Call ***toll-free*** **1-800-2-CANVAS, ext. 272.**
(MC, Visa, Discover, Am. Ex.) *or write:*

The Masters' Collection
Box 317540 • Dept. 272 • Newington, CT • 06131

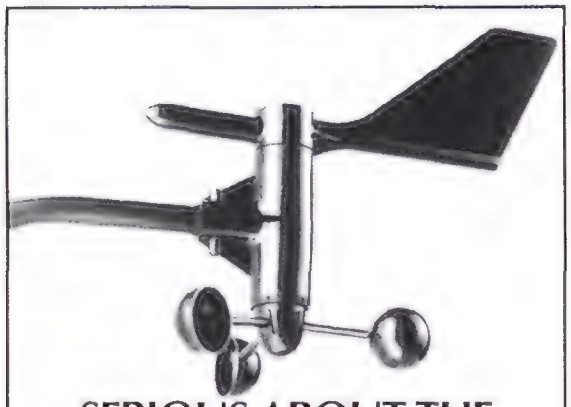
BUSH SHORTS
High Quality/Rugged Construction
Made in the U.S.A.

★ 6 Pockets ★ Olive Drab 100% Cotton
★ Black 100% Cotton ★ White 50/50 Blend
★ Khaki 100% Cotton Waist Sizes 26 to 46

CHECK • MONEY ORDER • MC • VISA
1-800-541-2841
P.O. BOX 4035,
DEERFIELD BEACH, FL 33442-4035

$15.95 + Shipping

Predict SAT* scores for 7, 8 or 9th graders.
Don't wait until grade 12.
College is too important.
Call today.
1-800-442-7728
Secondary School Admission Test Board
Testing private independent school children for over 30 years
*® College Board. No endorsement implied

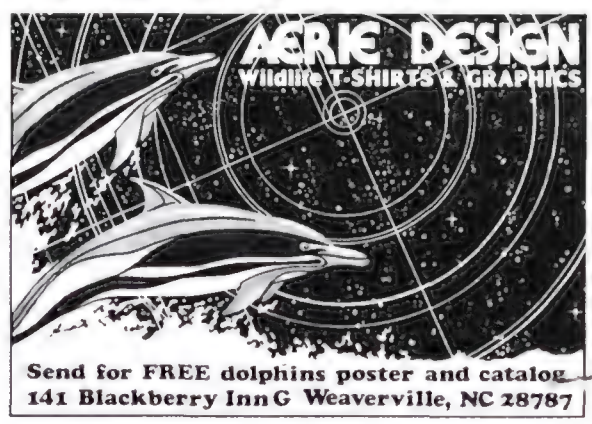


SERIOUS ABOUT THE WEATHER? NOW YOU CAN AFFORD A HOME WEATHER STATION.

With a new WeatherPro weather station, you and your family will have the local weather at your fingertips. Record the lowest temperature of the year, or the highest wind gust! Or check wind direction and speed on stormy days. Easy to install and simple to operate, includes a weather computer, remote precision wind direction vane, wind speed sensor, external temperature probe, mounting hardware and 40' of cable-**all for only $189!**

- •WIND SPEED
- •TEMPERATURE
- •WIND DIRECTION
- •TEMPERATURE HI/LO
- •RAINFALL (OPTIONAL)*
- •WIND GUST
- •WIND CHILL
- •TIME
- •AUTO SCAN
- •1 YEAR WARRANTY
- •14-DAY MONEY-BACK GUARANTEE

DIGITAR WEATHERPRO
WEATHER STATION: ONLY $189!
ORDER TODAY: 1-800-678-3669, SM
M-F 7AM-5:30 PM Pacific Time
*Automatic-emptying electronic rain gauge-$49.95
Add $5.00 for shipping. CA residents add sales tax.
Fax 1-415-732-9188 • M/C and VISA
DIGITAR®
3465 DIABLO AVE. HAYWARD, CA 94545



Send for FREE dolphins poster and catalog
141 Blackberry Inn G Weaverville, NC 28787

ARCHAEOLOGICAL TOURS *LED BY NOTED SCHOLARS*

1991 TOURS

YEMEN *Jan., Mar.*
EGYPT *Feb., Jun., Nov.*
EGYPT & ISRAEL *Nov.*
GUATEMALA *Mar., Nov.*
INDONESIA *Mar., Aug.*
MALTA, SARDINIA & CORSICA *May*
TUNISIA *May*
ANATOLIAN TURKEY *May, Oct.*
EASTERN TURKEY *Jun., Sept.*
SO. SHORES of TURKEY *Jun.*
HIMALAYAN KINGDOMS *Jun.*
SICILY & SO. ITALY *May, Oct.*
GREECE & CRETE *May*
BRITTANY *Aug.*
ANCIENT CAPITALS of CHINA *Jun.*
JAPAN *Sept.*
NO. INDIA & PUSHKAR CAMEL FAIR *Nov.*
THAILAND & MALAYSIA *Dec.*

archaeological tours

30 E. 42 St., Ste. 1202SM, NY, NY 10017 • (212) 986-3054

FREE TIMESHARE CLASSIFIED NEWSPAPER

BUY, SELL, RENT DIRECT
NO COMMISSIONS, NO FEES

WRITE FOR FREE ISSUE AND AD INFO.
TCI, BOX 313-S, CLOSTER, NJ 07624
OR CALL TCI TOLL FREE (800) 342-731

Energy Saving Catalog!

SAVE ENERGY COMPANY
• a planetary store •
2410 Harrison St. #A, San Francisco CA 94110 800-326-2120

CASHMERE WATCHCAP

Imagine. Cashmere. 100% Cahsmere. Built a beefy two layers thick. Turns up at the brim so you have four layers covering your ears. Warm and soft like nothing else. Not ever a hint of itch or scratch. Never debilitating. Lets your head breathe. Leaves you free to think. Allows you to perform.

Eighty-Five plus Four Fifty shipping.

Colors: Black, Charcoal Black, Bank Grey, Flannel, Navy, Cardinal, Claret, Bright Red-Orange, Magenta, Camel, Heavy Cream, Vermont Green, Light Navy, Lavender, Bear Brown.

VERMONT BIRD COMPANY
PO BOX 1008S RUTLAND VERMONT 05701 802 775 6754

TASTE VIRGINIA'S FINEST HICKORY SMOKED HAM

Order an Edwards' hickory-smoked Virginia ham early for your holiday entertaining or gift giving. There's no finer gift than an Edwards' ham cured the old fashioned way, slowly by hand. Cooked 9-10 lbs. - $55. Uncooked 11-12 lbs. $44. **FREE** 1 lb. Smoked Sausage with order.

S. WALLACE EDWARDS & SONS, INC.
P.O. Box 25, Dept. SM110 Surry, VA 23883
CALL TOLL FREE 1-800-222-4267

The Oxford University Press: An Informal History by Peter Sutcliffe, Oxford University Press, 1978

Narmada River dam (p. 118)

"A River, a Dam—and an Old Man's Last Battle" by Mark Fineman, *Los Angeles Times*, May 1, 1990

"India—Sardar Sarovar (Narmada) Projects," World Bank (Washington, D.C.), April 1990

"The Emperor's New Clothes: The World Bank and Environmental Reform" by Bruce Rich, *World Policy Journal*, Spring 1990

High and low art (p. 138)

High and Low: Modern Art and Popular Culture (exhibition catalog) by Kirk Varnedoe and Adam Gopnik, Museum of Modern Art, 1990

Modern Art and Popular Culture: Readings in High and Low, edited by Kirk Varnedoe and Adam Gopnik, Museum of Modern Art and Harry N. Abrams Inc., 1990

America's Great Comic-Strip Artists by Richard Marschall, Abbeville, 1989

Advertising: The Uneasy Persuasion by Michael Schudson, Basic Books (New York), 1984

Art and Illusion: A Study in the Psychology of Pictorial Representation by E. H. Gombrich, Pantheon Books (New York), 1960

G.B.S. and Molly Tompkins (p. 154)

To a Young Actress: The Letters of Bernard Shaw to Molly Tompkins, edited by Peter Tompkins, Clarkson N. Potter, 1960

Shaw and Molly Tompkins: In Their Own Words, edited by Peter Tompkins, Anthony Blond (London), 1961

Bernard Shaw: Volume II, The Pursuit of Power by Michael Holroyd, Random House, 1989

Penicillin (p. 173)

Howard Florey: The Making of a Great Scientist by Gwyn Macfarlane, Oxford University Press, 1979

Alexander Fleming: The Man and the Myth by Gwyn Macfarlane, Harvard University Press, 1984

"A Short History of the Penicillin Discovery from Fleming's Early Observations in 1929 to the Present Time" by Sir Ernst Chain, *The History of Antibiotics: A Symposium*, edited by John Parascandola, American Institute of the History of Pharmacy (Madison, Wisconsin), 1980

No. 8 Winter. Brrr. The J. Peterman Catalogue.

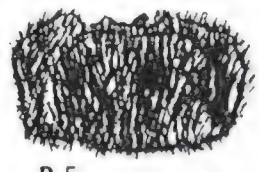
P. 60

P. 55

P. 81

P. 48

P. 47


P. 5

P. 8

P. 57

P. 89

© 1990 The J. Peterman Company

Catalogue to _____ name

address _____

city _____ state _____ zip

The J. Peterman Company
2444 Palumbo Drive
Lexington, Kentucky 40509
(800) 231-7341

S11

MAKES YOU ALMOST 2" TALLER

SIZES: 5-11
WIDTHS: B-EEE

FINE MENS' SHOES

Looks just like ordinary shoes except hidden inside is a height increasing innermold. Choose from a wide selection of Elevators, including dress shoes, boots and casuals. Satisfaction guaranteed. Exceptionally comfortable. Call or write today for your FREE color catalog so you can look 2" taller in almost no time. TOLL FREE 1-800-343-3810

ELEVATORS®

RICHLEE SHOE COMPANY, DEPT SMON
P.O. Box 3566, Frederick, MD 21701

Smithsonian highlights

Planning a Smithsonian visit?

The new VHS video *Guide to the Smithsonian* is an excellent aid for previsit planning. For ordering information and the free Associates' Planning Packet, send a postcard to Associates' Reception Center, Smithsonian, Washington, D.C. 20560, or call (202) 357-2700. For hearing-impaired visitors, use TDD and call (202) 357-1729. Begin your visit at the Smithsonian Information Center, located in the Smithsonian Castle. Hours are 9 A.M. to 5:30 P.M. daily.

Freer remains closed

The Freer Gallery of Art is closed until late 1992.

Contributing Membership Program

The Contributing Membership supports the Institution's work in education, research and scholarship. Partially tax-deductible contribution categories are: Supporting, $60 (available only to non-D.C. area residents); Donor, $125; Sponsoring, $300; Sustaining, $600; Patron, $1,200; James Smithson Society, $2,000. Members enjoy special privileges including receiving Smithsonian publications and the engagement calendar. For more information write to the Contributing Membership Program, 1100 Jefferson Drive, S.W., Smithsonian, Washington, D.C. 20560, or call (202) 357-1699.

Special November exhibits and events

Cooper-Hewitt Museum (New York)
Gold of Greece: Jewelry and Ornaments from the Benaki Museum (through January 13) More than 200 objects from the renowned Athens museum.

WWII FIGHTER COLLECTION
Authentic Hand Carved 12½" Aircraft Models
A magnificent array of famous combat planes, hand carved out of solid mahogany and hand painted by expert craftsmen
The Kittyhawk Gallery
Dept. 3A
Call or write for free catalog

FRASER CREATIONS
RUGGED LIGHTHOUSE HANDCRAFTED IN SCOTLAND. $39.00 ppd.
Send $1.00 for Fraser catalog.
CALL TOLL-FREE
1-800-28GRECO
5¼"H x 4"W
Greco COLLECTIBLES
P.O. Box 14265, Dept. S
2760-R S. Havana St.
Aurora, CO 80014

GOLFER'S LUCKY STYMIE MARKER
Lucky is the golfer who has this lucky four-leaf clover (instead of a coin) to mark his place on the green. Solid brass, a lifetime gift. Any name expertly engraved. Full price $5.00 each. Money back if not delighted. We ship in 2 days. Mail orders direct to Elgin Engraving Co., 522 Stevens Ct., Dept. 7, Dundee, Illinois 60118
HERE LIES CHRIS

THE POKE BOAT®
IT'S EVERYTHING A CANOE ISN'T.
It weighs only 28 pounds. For less than $700 you can buy more than a canoe.
Call toll-free 1-800-354-0190.

Actual Size
Bee Pin
Can also be worn as a pendant.
Hand cast antique sterling silver.
14K gold with two ruby eyes.
Gift boxed with 18" chain.
Silver $45 #SB102
Gold $310 #GB512
Plumtree & Smith Ltd.
3958 Northlake Boulevard
Dept. H #243
Palm Beach Gardens, FL 33410
407-687-2457 Visa-M/C-Check-Money Order

Turtle Pin
Actual Size
Can also be worn as pendant.
Hand cast antique sterling silver.
14K gold with two ruby eyes.
Gift boxed with 18" chain.
Silver $45 #ST103
Gold $310 #GT513
Plumtree & Smith Ltd.
3958 Northlake Boulevard
Dept. H #243
Palm Beach Gardens, FL 33410
407-687-2457 Visa-M/C-Check-Money Order

Tiger Pin
Actual Size
Hand cast antique sterling silver or 14K gold with ruby eye.
Plumtree & Smith Ltd.
3958 Northlake Boulevard
Palm Beach Gardens, FL 33410
Visa-M/C-Check-Money Order
Silver $75 #SP104
Gold $450 #GP514
407-687-2457

DON'T BE FOOLED...
Buy Direct From Our USA Bronze Foundry
"Lost Wax Bronze Castings"
FREE CATALOG
Many other famous works available
SPECIAL OFFER
FOUNDRY
Established In 1969
"The Cheyenne" By Frederic Remington
$350 full size
Clark Foundry
295 W. State Rd. 50 • Winter Garden, FL 34787
800-782-8205 or 407-656-9464 • FAX 407-877-6019
Shipping and Handling Additional MC VISA AMEX

LIFETIME POCKET SCREWDRIVER
Handiest gadget ever! Only 2 in. long, fits on his or her keychain . . . ready to open lids & lighters, fix motors etc. 1001 uses! We smartly engrave owner's initials. Guaranteed forever. Made of solid gleaming Stainless Steel. Full price $5.00 each. Money back if not delighted. We ship in 2 days. Mail to: Elgin Engraving Co., 522 Stevens Ct., Dept. 7, Dundee, Illinois 60118.

Handcrafted Sterling Silver Pendants
YIN-YANG-Bone & Onyx
Satisfaction Guaranteed
HIS, $18.00 HERS, $15.00
Tenn. Res. Add Sales Tax
Terra TRADING COMPANY
P.O. Box 176 - Dept. S
Mason, Tenn. 38049
HIS HERS
Send $1.00 for Catalog

GREAT USED WATCHES
Save up to 60% Latest Models
ROLEX, Cartier, Patek-Philippe, et al. America's largest selection. All meticulously restored to showroom new. Call for FREE Brochure.
GRAFSTEIN & CO.
Value and Integrity Since 1939
(714) 835-6100 (800) 442-7866
Santa Ana · Beverly Hills · New York

TAKE YOUR MIND ON VACATION
SHAW
THE GUIDE TO ACADEMIC TRAVEL
258 Adult Study Vacations Worldwide
Sponsored by Museums, Colleges and Educational Organizations
At bookstores or $16.95 ppd. from: ShawGuides, 625 Biltmore, #1406 SK Coral Gables, FL 33134
• Guidebooks for Savvy Travelers •

CANADIAN ARCTIC
Stand at the NORTH POLE.
Birding, Aurora, Wildlife or Dog Sled Trips
ARCTIC ODYSSEYS
Box 37S, Medina, WA 98039 (206) 455-1960

PERSONALIZED CARTOUCHE
Your name or initials translated into ancient Egyptian Heiroglyphics
Free Brochure Available
Cartouche shown "Jane"
18k Gold Pendant from $150
Sterling Silver $40
1-800-237-3358
Discoveries
207 Ramsay Ave, Alexandria VA
(703) 548-9448 in VA: 22314
HANDMADE IN EGYPT

New Natural Way To Sleep

Pure Cotton Knit

Tee-PJ's resemble a T-shirt, but over a foot longer. Special knit gives when you move, eases up when you relax. No bind, no bunch, no chafe, no buttons, no ironing! **Most comfortable sleeper you've ever worn or your money back.** (Great for Ladies, too.) Choose snow white or soft blue. S-M-L-XL. IMPORTANT — to ensure best fit include height-weight. ORDER NOW, while prices include postage/handling — a sizeable cost!

$16 ea. 3 for $36 (SAVE $12)

Long sleeve style (not shown)

$21 ea. 3 for $49 (SAVE $14)

100% Cotton Knit SLEEP CAP

Holds in up to 40% of body heat the head can lose! Special knit "gives" naturally to fit *any* head (man's or woman's); never constricts or binds . . . caresses your scalp with gentle warmth! Colors (matching Tee-PJ's above): choose snow white or soft blue.

Only $4.95 or 3 for $9.80 (SAVE $5)

Postpaid if you order promptly!

WITTMANN TEXTILES, Dept. 65
Hobe Sound, FL 33475 *(Ship. to FLA add 6% tax)*
Natural Fiber Specialists Since 1955

CUSTOM CASES
Oak & Cherry
with glass
removable top & back
Shelf Cases & Wall Hangings
11200 Bybee St., Silver Spring, MD 20902
1-800-842-5786
VISA/MasterCard/American Express

Mercury Dime Starter Set vg/vg or better 1935, 1936, 1937, 1939, 1941, 1942, 1943, 1944, and 1945. $8.99 postpaid. *Satisfaction Guaranteed.* The Dime Store, Dept. SM, 15540 Kilmarnock Drive S.E., Fort Myers, FL 33912. Free dime catalog on request.

HARMONY BAY SILVER DOLPHIN

Gift pendant or earrings. In silver or pewter

Main Street-New England
The Mercantile Co., Inc.

Silver **$45.00**
Pewter **$25.00**
PP

1-800-442-4171
(R.I. 539-1099)
Free Catalog of Traditional New England Items

CLEAN AIR CLEAN WATER
CONTROL YOUR HOME ENVIRONMENT
with our Air & Water Purifing Machines.

Eliminate allergy causing dust and pollen.
Remove harmful chemicals from your drinking water.

ENVIRONMENTAL CONCEPTS

Free Catalog **800-255-3833**

Fencepost Vase

Carved from vintage Montana cedar fenceposts. Our best selling catalog item. Only $21 each.

Genuine Montana
908 East Main
Billings, MT 59105
FREE catalog • 1 800 533 4684

See *Highlights continued*, page 202.

Eighteenth Century Scenic and Architectural Design: Drawings by the Galli Bibiena Family (through December) Works by the creators of Baroque theaters and stage sets.

Mondo Materials (through February 24) Collages from high-tech materials.

Anacostia Museum

Gathered Visions: Selected Works by African-American Women Artists (November 18-April 28) Paintings, drawings, fabric art, sculptures and prints by 15 Washington, D.C. area artists.

National Museum of American Art

Harlem Document: Aaron Siskind's Photographs, 1932-1942 (November 22-March 17) Sixty eloquent images.

Made With Passion: The Hemphill Folk Art Collection (through January 21) Nearly 200 works from one of NMAA's most significant acquisitions.

Childe Hassam: An Island Garden Revisited (through January 6) Images of the Isles of Shoal, New Hampshire.

Visual Poetry: The Drawings of Joseph Stella (through November 12) Sixty of the painter's drawings and collages.

International Gallery, S. Dillon Ripley Center

Moscow: Treasures and Traditions (November 16-February 3) A major exhibition of icons, paintings, porcelains, costumes and metalwork, seen for the first time outside the Soviet Union.

National Museum of Natural History

Healing a River: 50 Years in the Life of the Potomac (November 29-January 25) A show commemorating the 50th anniversary of the Interstate Commission on the Potomac River Basin.

Sharks! Fact and Fantasy (through January 20) Comprehensive look at sharks and their behavior.

North American Wild Flowers (runs indefinitely) A commemorative exhibit honoring painter Mary Vaux Walcott.

A Jeweler's Art: Masterpieces from Van Cleef & Arpels (through November 30) The famed company's creations, 1920s through '50s.

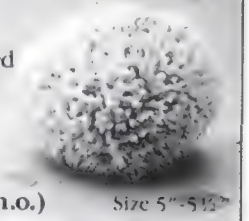
Renwick Gallery

Structure and Surface: Beads in Contemporary American Art (through November 25) Creations by 12 artisans.

Four Contemporary Calligraphers (through January 1) English, Chinese, Arabic and Hebrew manuscripts.

THAILAND
Superior Group / Independent Travel
Southeast Asia - It's All We Do!
Bolder Adventures
(800) 397-5917 • POB 1279 • Boulder, CO 80306

D U N N I N G H A M ' S
Naturally Naked Sea Sponge



- Only the finest quality
- Each carefully hand picked
- For bath and shower
- Soft and longlasting
- Custom gift boxed

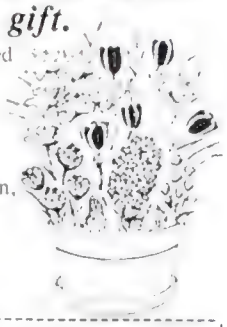
$19.95 + $2.50 s/h (ck or m.o.) Size 5"-5½"
1-800-835-2246 Ext. 328 (Amex welcome)
Dunningham's, P.O. Box 32831, Baltimore, MD 21208

Inclinette®
Ride, Don't Climb.

Ride up or down stairs quickly and easily with Inclinette, the custom-built, single-seat stair lift from Inclinator Co. of America. For more information, write today:

INCLINATOR
COMPANY OF AMERICA
Dept. 5
P.O. Box 1557
Harrisburg, PA 17105-1557

FLOWERING DUTCH GARDEN
A unique and exciting gift.



Just add water. . .19 carefully selected bulbs (5 varieties) are potted, rooted, and ready to **bloom in stages** for weeks. Only **$25.00** ea.

Compliment your Dutch Garden with a beautifully handcrafted, woven, New England Ashwood Basket (not pictured). **$15.00** ea.

Shipping begins Dec. 3 to Mar. 15.
Order now for Christmas delivery.

Please send _____ Dutch Gardens @ $25.00 ea. ppd
_____ Gardens w/basket @ $40.00 ea. ppd.
Total $_____ ☐ Payment enc. ☐ MC ☐ Visa
Card# _____ Exp._____
Name _____
Street _____
City _____ State_____ Zip_____

MARLBOROUGH GREENHOUSES, INC.
P.O. Box 32 S • Marlborough, NH 03455 • 603-876-4397

SEE THE SEALS FACE TO FACE

I.F.A.W. founder Brian Davies

Seal Watch—During 3 weeks every March, people of all ages journey to visit 250,000 Harp Seals on the ice floes of Eastern Canada's Gulf of St. Lawrence.

5 to 8 day excursions including air fare from Halifax, Nova Scotia to the Magdalen Islands, hotels, some meals, helicopters to the ice, and much more, start at $1,295. For a free full color brochure call today or write to:

NATURAL HABITAT

WILDLIFE ADVENTURES

One Sussex Station, Sussex, NJ 07461

TOLL FREE: 1-800-543-8917 • NJ (201) 702-1525

This wildlife adventure is made possible by The International Fund for Animal Welfare (IFAW) whose efforts have replaced seal hunting with seal watching.

Authentic
AMISH QUILTS

Heirloom quilts and wall hangings handcrafted by the Pennsylvania Amish

Send $3.00 for catalog to
Authentic Amish
1602 Walnut Bottom Road
Newville, PA 17241

Call (717) 776-7814

Top Grain U.S. Leather Only $69.95

Leather Tote Bag

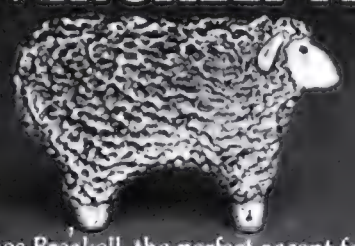
Carries all with Style!

This roomy sports bag is perfect for getaways, sportings equipment, clothing, etc. End pockets hold all your toiletries.

Lined, sturdy zippers, double handle, detachable shoulder strap. **Great gift!**
Bag size: 21"x12"x11"
Brgdy, Gry, Tan & Blue

Send $69.95 plus $5.50 (insured, ship/Hand). Use 30 days, **Money Back** if not pleased. MasterCard & Visa accepted. **Order now!** 1-800-442-9991 or send check or money order to: Selectronic, 3166 Midway Dr. #111, San Diego, CA 92110. Special 2 Bags for $129.95. (Calif. residents add applicable tax.)

SILVER SHEEP PIN



From James Breakell, the perfect accent for your favorite woolen wear. Sterling $40. 14K Gold $530. Add $3.50 for handling. AMEX/ VISA/MC 800-767-6411.

J.H. Breakell & Co.

69 MILL STREET, DEPT. SMSS, NEWPORT, RI 02840

Arthur M. Sackler Gallery
The Arts of China (opens November 18) More than 200 objects, including sculptures and paintings, span 6,000 years.
Antoin Sevruguin: Photographs of Iran, 1880-1910 (through May 26) An intriguing documentation of everyday life.
Chinese Lacquered Furniture (through April 30) Pieces from the 15th through the 18th centuries.

National Museum of American History
Carry Me Home: Photographs by Debbie Caffery (through December) Images of Louisiana's sugarcane culture.
This is your Childhood, Charlie Brown: Children in American Culture, 1945-1970 (through April) A look at post-World War II children, as depicted in *Peanuts* comic strip.

National Museum of African Art
Paramount Chiefs of Sierra Leone: Photographic Portraits by Vera Viditz-Ward (November 21-September 2) Contemporary photographs from West Africa.

National Portrait Gallery
Old Hickory: A Life Sketch of Andrew Jackson (November 9-January 13) The seventh President's accomplishments and era, through paintings, memorabilia.

Hirshhorn Museum & Sculpture Garden
John Baldessari (through January 6) The first major retrospective on the influential Los Angeles artist's work.
DIRECTIONS: Boyd Webb (through January 27) Photographs by the London-based artist.
Lawrence Weiner: WORKS (through March 3) The New York artist's interior installation.

National Air and Space Museum
Trust But Verify / Do Veri, No Pro Veri A new permanent exhibition features a U.S. Pershing II missile and a Soviet SS-20 missile and explains the Intermediate-range Nuclear Forces (INF) Treaty between the two countries.
A Piece of Mars? (indefinite) The fragment of meteorite discovered in Antarctica and thought to be from Mars.
Drawings and Things by Rowland Emmett (through November 26) A lighthearted look at airplanes, spacecraft.

Exhibition catalogs

Catalogs available currently include:
Moscow: Treasures and Traditions (paper $24.95; cloth, $50)

From our Celtic Jewelry Collection

BARCUD

The Red Kite (Barcud in Welsh), once common throughout Britain, retains a precarious foothold in Wales. Wear this pendant as a symbol of your concern for the endangered species of our earth.

Shown full size.

No. 3278 Barcud (Red Kite)
Sterling silver $30.00
18" sterling chain
14 kt. gold $150.00
chain not included

Check, M/C, Visa or Amex. Add $3.00 for handling
Satisfaction guaranteed. Send for our unique catalog
Visit our store when in the Seattle area
For orders and inquiries telephone (206) 485-2132.

David Morgan

11812 Northcreek Pky. N., Suite 103, Bothell, WA 98011

No Ferrari?
TEST SPIN OUR ELEGANT
HANDCRAFTED YO-YOs
AND GIVE THE BEST!

Wooden Monarch YO-YOS

Finest Hardwoods — Exotic and Domestic
Made and Tested Individually by Tom Holmes
INTRODUCTORY OFFER: Middleweight Yo-Yo $16
plus $2.25 (S & H) with complete list of woods and options available
Send to: **WOODEN MONARCH YO-YOs**
1187 COAST VILLAGE RD.
#249, MONTECITO, CA 93108

SATISFACTION GUARANTEED

GEO EXPEDITIONS

THERE'S A LOT TO BE SEEN IN EAST AFRICA!

Spectacular safaris to **Kenya, Tanzania, Botswana,** and **Rwanda.**

800 351-5041
63 S. Washington, Ste A
P.O. Box 3656-N8
Sonora, CA 95370

THE BEST UNDERSTATEMENT EVER MADE.

Quality fabrics, colors, patterns. Sea-island cotton* boxer shorts you can't buy in stores. For exclusive brochure:

THE GREEN POND COMPANY®

Dept. GP-3 3060 Peachtree Rd., Atlanta, GA 30305, 1-800-827-POND

Authentic!

Afghan Hat

As worn by Afghan freedom fighters

Simple, Handsome, Rugged, and now Battletested
Hand Spun Karakul Wool • Great Winter Hat
A Shangri-la Masterpiece
Check M.O. AmEx to Aalishan, Inc.
P.O. Box 30025, Alexandria, Va. 22310
1-703-243-2548

One Size
$20.00 (We pay shipping)
Dark Camel or Off White • Your satisfaction is guaranteed

Cat Stickers

Sleek Black Cats imprinted in white with your name & address or slogan...purrfect for letters, books, luggage, tapes, gifts, reminders, promotions

Cat Shape...Self-Stick...1⅝" high
100 for $9.50 200 for $12.90 ppd.

CATS, Box 735-E, Acton, Mass. 01720

LUXURY YACHT CRUISE

1-800-494-2490

Book individuals or groups on 18-20 Pax Luxury Trimarans - Largest in the World. Choice of two beautiful island groups

GALAPAGOS • BRITISH VIRGINS

Trimarine Dept. SM Box 4065 St. Thomas VI 00803

HAND CARVED MAHOGANY
JET FIGHTERS

- 16" to 22" models are hand-crafted from solid mahogany with handpainted markings and details
- Over 160 models in stock
- Priced from $99.50
- Satisfaction guaranteed

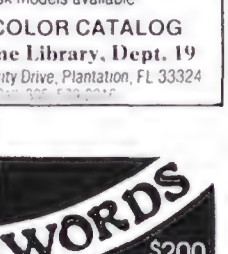
PACIFIC AIRCRAFT
WORLD'S LEADING MAKERS OF FINE AEROSCULPTURES
14255 North 79th Street
Scottsdale Airpark, AZ 85260
(602) 991-1841

Call 1-800-950-9944

CHRIS RIGGS
PA FORD
Janna
"BOOTS"

What's new? SHOESTRING NAMEPLATES that fit snugly on the bottom rung of any shoe lace as shown at right. Lifetime solid brass, only 1" x ¼", engraved any way you wish. Handsome, decorative (and they are neat IDs for joggers & children) Full price $2.50 each. Money back if not delighted. We ship in 2 days. Mail orders direct to ELGIN ENGRAVING CO., 522 Stevens Ct., Dept. 7, Dundee, Illinois 60118

CLASSIC T-SHIRTS!
Beethoven, Confucius, Da Vinci, Jung, J.F.K., Mozart, Shakespeare, Cheshire Cat, Twain, Darwin, Van Gogh, Gandhi, Nietzsche, Poe, Thoreau, Austen, Sherlock Holmes, others.
T-Shirt: (white or lt. blue) $12.75, 4/$46.
Sweatshirt: (white or grey) $23, 2/$44.
Sizes: S, M, L, XL. **Ship:** $2.25 per order
Illustrated brochure: 75¢
Historical Products, Box 220 SZ



Cambridge, MA 02238

RECYCLED PAPER
FREE CATALOG

SAVE NATURAL RESOURCES WITH BEAUtiful note cards, stationery, gift wrap, and holiday cards made from recycled paper. Printing, office, and computer papers too!

EARTH CARE PAPER INC.
PO Box 14140, Dept. 575, Madison, WI 53714
(608) 277-2900

REPLACEMENTS, LTD.

A Million Pieces!
Active and Discontinued
China, Crystal and Flatware

To Buy or Sell:
Call (919 668-2064, or write:
302 Gallimore Dairy Rd., Dept. SMNOA
Greensboro, NC 27409-9723 (SASE Please)

WORLD GLOBES
50 Globe Models Hand crafted solid wood floor mountings. Brass meridians
Prestigious addition to home or office
Desk models available
FREE COLOR CATALOG
The Home Library, Dept. 19
160 S. University Drive, Plantation, FL 33324

日本刀
JAPANESE SWORDS
For Free Evaluation Sheet
TOLL FREE 800-435-5119
$200 $250,000 CASH PAID
French Art Glass (Galle, Daum), Tiffany Lamps Also Wanted
David E. J. Pepin—Member NBTHK, Tokyo, Japan
Dept. SI, P.O. Box 354, Grant Park, IL 60940

Visual Poetry: The Drawings of Joseph Stella ($24.95, paper; $45, cloth)
Harlem Document: Aaron Siskind's Photographs, 1932-42 (paper, $14.95)
To order, send check or money order to Museum Shops, 3301 75th Avenue, Landover, Maryland 20785. Include 15 percent of total purchase to cover postage and handling (minimum, $1.75).

Smithsonian on the air

Radio Smithsonian: Features include stories on gospel music, songs of struggle, and the folk art collection of the National Museum of American Art.
Here at the Smithsonian: Three-minute TV spots take you behind the scenes. To find out which stations in your area carry these programs, write: Office of Telecommunications, MAH Room BB40, Washington, D.C. 20560.
The Earth in our Hands: Robert Redford narrates a film exploring the Smithsonian's Marine Systems Laboratory on the Discovery Channel, a cable network, on December 2. Check local listings for time.

Resident Associate Program

To become a Resident Associate, or for fee and ticket information, call 357-3030. Here is one November event:
A Woman Called Truth (October 30-November 24; Tuesdays through Fridays at 10 A.M. and 11:30 A.M.; Saturdays at 11:30 A.M. and 1 P.M.) Discovery Theater presents the play for young people about the life of Sojourner Truth.

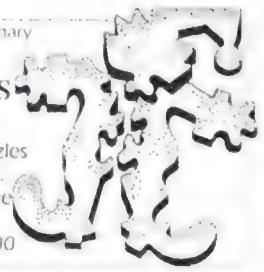
Smithsonian Institution Traveling Exhibition Service

SITES organizes and circulates exhibitions to cities throughout the United States and abroad. To sponsor a show in your community, write SITES, Smithsonian, Washington, D.C. 20560. Here are some November exhibits:
Slidell, Louisiana (November 3-December 16) *All Systems Go: America's Space Transportation System for the 1990s*, Cultural Art Center.
Williamstown, Massachusetts (November 17-January 13) *Irish Decorative Arts from the Collections of the National Museum of Ireland, Dublin*, Clark Art Institute.
Yuma, Arizona (November 10-December 16) *The Legacy Endures: Conserving Waterfowl and Wetlands*, Yuma Art Center.

A MASTER'S CALLIGRAPHY
'Love'
Handcrafted in USA·solid 14K gold
Large $99 · Small $60
(415) 982-3618 · MC/VISA
Asia Jewelry Co.
955 Grant Ave. · S.F., CA 94108

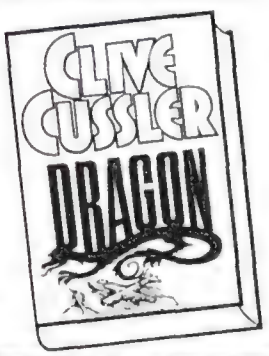
You will love this very colorful 100% Cotton Power T. It is Guaranteed to get attention! It makes a
GREAT CHRISTMAS PRESENT
and stocking stuffer for all your environmentally concerned friends!
FRONT Surprise someone you love this Christmas. BACK
Buy 5 get 1 free
Only $15.00 + $2.00 — S/H per shirt
Immediate Delivery! Please specify Med., Lg., or XL
Direct Action—Box 21743—Charleston, S.C. 29413-1743

Certain gifts simply must be extraordinary
THE FAMOUS
Stave Jigsaw Puzzles
Since 1974, the finest handcut personalized wooden jigsaw puzzles being made today. $190 - $2000.
Call or write for 36-page catalogue
Stave Puzzles, Box 329H,
Norwich, VT 05055 802-295-5200



GALAPAGOS
You, 9 other adventurers and our licensed naturalist will sail by yacht to explore more islands than any other Galapagos expedition.
50 Trip dates. Machu Picchu Option.
FREE BROCHURE
INCA FLOATS 415-420-1550
1311S 63rd ST, EMERYVILLE, CA 94608

BOOKS ON TAPE®
World's Largest Selection of Audio Books



- Best Sellers on Cassette
- Full-length Readings
- Call for Free Brochure

Box 7900-S, Newport Beach, CA 92658
Reg.U.S.Pat.&T.M.Off.
(800) 626-3333

DO SOME EARTHLY GOOD
Join the Sierra Club — the world's largest grassroots environmental organization.

	IND.	JOINT
REGULAR DUES	☐ $33	☐ $41

Name _____
Address _____
City _____
State _____ Zip _____
Enclose check and mail to: SIERRA CLUB
Dept. J-241, P.O. Box 7959, San Francisco, CA 94120
Annual dues include *Sierra* subscription ($7.50) and Chapter publications ($1). Dues are not tax-deductible

Golden ornament from Greece

Set in the heart of Athens, a splendid neoclassical villa holds some of Greece's most extraordinary art and artifacts. The Benaki Museum, founded in 1930 by Hellenophile and collector Anthony Benaki, is one of the world's most captivating small treasure houses.

Now armchair travelers who have dreamed of making a pilgrimage to the museum on Koumbari Street can discover some of its charms at home. "Gold of Greece: Jewelry and Ornaments from the Benaki Museum," at the Smithsonian's Cooper-Hewitt Museum in New York, offers an enchanting reprise of one collection from the Benaki's holdings.

The museum's array of objects worked in gold spans the centuries, and the genius, of Greek civilization, offering a glimpse of the motifs and embellishments that characterized cultures from Mycenae to classical Athens and beyond.

Jewelry created in the palace workshops of the Mycenaean Greeks melded the antic images introduced by Cretan artisans—the lilies and octopuses, seashells and papyrus flowers—with an eye for symmetry.

The handful of surviving pieces from Archaic Greece, adorned with details such as bull's heads and kneeling archers, reflect a new passion for elevating the images of everyday life. By the fifth century B.C., craftsmen had raised jewelry making to a high art, as they fashioned ornaments for the prosperous citizens of classical Athens.

This tradition of exquisite artisanry continued, as goldsmiths assimilated new images from Alexander the Great's expanding empire. When the Romans conquered Greece, they too developed a demand for luxurious ornament. Byzantine goldsmiths also drew on this legacy, as did successive generations of Greek artisans working into the 18th and 19th centuries.

The show, accompanied by a handsome and deftly informative catalog, continues through January 13 and travels on to San Diego and San Francisco.
Kathleen M. Burke

Image of kneeling archer, adorning ring, was familiar motif in late-Archaic art.

Bull's head pendant, early fifth century, may have been produced in Thessaly.

Wreath, late Hellenistic or Roman, is fashioned of beaten-gold oak leaves.

Constantinople artisans made ornament for Greek Orthodox prelate, 1600s.

Byzantine earrings feature emeralds and carnelians in elaborate gold settings.

Images of woman, swan, on Hellenistic ring suggest the tale of Leda and Zeus.

MALLARDS AT SUNSET

Premiere porcelain sculpture presented by Ducks Unlimited.

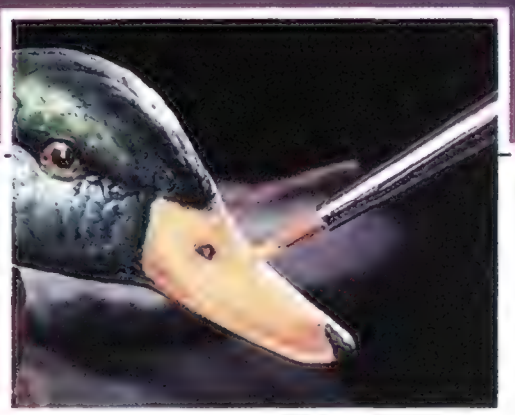
A breathtaking work of art by the two-time winner of the "Best in the World" award, Anthony J. Rudisill.

In the mist of a golden sunset, two mallards gently glide to a landing on the shore of a tranquil marsh.

Mallards at Sunset. A premiere in fine porcelain from Ducks Unlimited, an organization whose dedication to the preservation and conservation of wildlife is second to none.

Designed by Anthony J. Rudisill, two-time winner of the "Best In The World" award for waterfowl sculpture. Individually cast in the timeless beauty of fine hand-painted porcelain, and displayed on a custom-designed hardwood base.

A dramatic showpiece for your home or office... and a wonderful tribute to the splendor of nature, Mallards at Sunset is available exclusively through The Franklin Mint, at the issue price of $295.



Meticulously painted by hand with colors as brilliant as nature's own.

SHOWN SMALLER THAN ACTUAL SIZE OF 9½" IN HEIGHT. HARDWOOD BASE INCLUDED.

DUCKS UNLIMITED

AN OFFICIAL ISSUE OF DUCKS UNLIMITED

Ducks Unlimited
c/o The Franklin Mint
Franklin Center, PA 19091

Please mail by November 30, 1990.

Please enter my order for Mallards at Sunset, an original work of art by Anthony J. Rudisill. And the first official sculpture in porcelain issued to the public by Ducks Unlimited.

I need send no payment now. Prior to shipment of my imported sculpture, I will be billed for my deposit of $59.* and, after shipment, for the balance in 4 equal monthly installments of $59.* each. Hardwood base included at no additional charge.

*Plus my state sales tax and a one-time charge of $3. for shipping and handling

SIGNATURE

MR/MRS/MISS

ADDRESS

CITY

STATE/ZIP

© 1990 FM

12796-3

The Smithsonian Traveler

THE LATEST WORD ON TOURS, EXPEDITIONS AND LEARNING ADVENTURES.

Smithsonian Odyssey Tours
Value is the byword of the Smithsonian's brand-new Odyssey Tours. Choose from 14 foreign and domestic itineraries at rates substantially below what you would expect. Destinations include: South Asia, Britain, Italy, France, Greece, Iberia, South America, Canada, Mexico and the United States. For information, call 1-800-524-4200.

Domestic Study Tours

Smithsonian "Anytime" Weekend
Explore Washington, D.C.'s museums; enjoy a "Castle" tour.

Christmas at the Smithsonian *December 13-16*
Visit Ford's Theater and the U.S. Capitol.

Florida Everglades *January 22-30* Canoe the Ten Thousand Islands.

Birds of South Texas *February 16-23* Learn birding techniques at wildlife refuges.

Yellowstone in Winter *February 16-23*
History, ecology and cross-country skiing.

NEW New York Theater *March 1-3* Visit production houses; see Broadway plays.

Charleston-Savannah *March 19-26*

Sapelo Island *March 28-April 1* Explore this Georgia barrier island.

New Orleans-Natchez *April 7-14*

Historic Homes of North Carolina *April 9-17*
New Bern, Edenton, Outer Banks.

Arizona in Spring *April 10-18* From the Sonoran Desert to the Chiricahua Mountains.

Sojourn in Sedona *April 18-25* Arizona natural history and art.

Big Bend (Texas) *April 18-27*

Okefenokee *April 29-May 4* Canoe in a wildlife refuge.

Detroit Auto Barons *May 2-5*

NEW Jefferson's Virginia *May 3-9* Visit Richmond, Charlottesville, Monticello.

NEW Hawaii Camping *May 18-June 1*

Foreign Study Tours

Interludes *November-April* Uncrowded museums, cultural events and leisurely exploration in Munich, Prague, Paris, Lisbon, Vienna, Hong Kong or Kyoto.

Christmas in Europe York and Edinburgh, Canterbury or Switzerland.

South America Adventure *January 3-23* Cruise around Cape Horn on the *Seabourn Pride.*

India Wildlife *January 13-February 7*

Yucatán Adventure *January 16-28*

USSR Performing Arts *January 18-31*
Includes the Bolshoi and Kirov theaters.

Kenya-Tanzania *January 24-February 10*

NEW Antarctica, South Georgia and the Falkland Islands *February 1-23* Aboard the icebreaker *Polar Circle.*

Far East Adventure *February 6-26* Singapore, Malaysia and Thailand.

Guatemala *February 13-25* Explore monumental Mayan ruins.

Red Sea Cruise *February 17-March 2*

NEW Belize Cruise *February 19-March 5*
Cozumel to Panama.

Indonesia Cruise *February 20-March 7*

NEW Bermuda *February 21-25*

Countryside Tours *February-September*
Relaxing sojourns in Mexico, Greece, Italy, France, England, Switzerland, Austria, Wales and Germany.

NEW Reindeer Safari (Finland) *February 24-March 5*

NEW St. Kitts *February 28-March 9*

NEW Indian Ocean Cruise *March 1-19*
For Smithsonian Contributing Members.

Australia-New Zealand *March 1-21*

NEW Belize Adventure *March 2-9*

NEW Treasures of Mogul India *March 5-25*

NEW Alpine Snow Train (Switzerland) *March 7-19*

Sea of Cortés *March 13-20* Cruise Mexico's Gulf of California.

Budapest Music Festival *March 13-24*

Morocco *April 13-27*

NEW Dutch-Belgian Cruise *April 13-28*

USSR and Central Asia *April 14-27*

NEW Islands of the Western Mediterranean *April 17-30* Aboard the *Renaissance.*

Costa Rica *April 18-May 3*

British Theater *April 19-29*

Nile Cruise *April 19-May 5*

Galápagos Islands *April 20-May 1* On the *Isabela II.*

Gardens of Northern Italy *April 23-May 4*

Berlin, Prague and Budapest *May 1-12*

Brazil-Argentina *May 1-15*

Splendors of Italy Cruise *May 5-22* Aboard the *Argonaut.*

NEW Mozart and His World *May 8-19*
Austria and Czechoslovakia.

USSR Natural History *May 17-31*

Treasures of Spain *May 17-June 2*

NEW Garden Tours *May-June* Private and public gardens and estates in Yorkshire, England; southern France; the Italian lake district.

Japan Cruise *May 19-June 3*

Dorset Walks (England) *June 13-25*

Ireland *June 14-24*

Savoy Walks (France) *June 14-24*

Smithsonian Seminars

Explore diverse topics in depth with top scholars during classroom study and tours.

NEW Eastern Europe-USSR Update *November 27-30* Washington, D.C. Journalists Hedrick Smith and Peter Jennings discuss dramatic political and cultural changes.

Write to Smithsonian National Associate Program, Washington, DC 20560 or call (202) 357-4700 for tour and seminar brochures.

SMITHSONIAN-STYLE

NEW **Story into Art: Exploring Mythology and Visual Images** *February 11-15* Washington, D.C.

NEW **Broadcast Journalism** *March 10-15* Washington, D.C. Daniel Schorr, Judy Woodruff and others discuss television news past and present.

NEW **Information Age** *March 25-28* Washington, D.C. Explore the effects of computers on society.

NEW **Carrier Warfare in the Pacific** *April 8-12* Washington, D.C.

Twentieth Century Furniture *April 15-19* Washington, D.C.

NEW **Inside Smithsonian Magazine** *May 6-9* Washington, D.C. Led by writers, editors and production staff.

The New Astronomies *May 12-17 or 19-24* Tucson, Arizona

Southwestern Archaeology *June 3-7* Santa Fe, New Mexico.

NEW **Air Force History** *June 12-15* Dayton, Ohio. Attend classes at Wright-Patterson Air Force Base.

Research Expeditions

Contribute your talent and financial resources to Smithsonian research. Work with curators in Washington, D.C. or at field sites worldwide.

Cancún, Mexico *February 8-22* Study birdlife and vegetation.

Jamaica *February 22-March 4* Document the Hindu festival Pagwah.

Costa Rica *April 6-18 or July 6-18* Monitor geologic activity and collect plant specimens at an active volcano site.

NEW **Calvert Cliffs, Maryland** *May 2-11* Collect fossils along the Chesapeake Bay.

Washington, D.C. *May 21-31* Inventory sculpture in the nation's capital.

Front Royal, Virginia *July 6-14* Study wildlife and vegetation in the Shenandoah Valley.

NEW **Jamaica** *July 16-28* Record the East Indian festival Hosay.

(202) 287-3210 for expedition brochures.

THINK OF THIS AD AS YOUR OWN LITTLE MALL — FOR ALL YOUR HOLIDAY SHOPPING!

Attention Shoppers... With ONE TOLL FREE PHONE CALL... 1-800-228-9055... have specially-priced gifts of tender, juicy, world-famous Omaha Steaks® delivered nationwide. Unconditionally Guaranteed!

Hurry Shoppers...

You must call by December 10th for delivery in time for Christmas.

SAVE $20.00	SAVE $24.05
#678 Four (6 oz.) Filet Mignons, & One (4 oz.) Pkg. of Seasoned Butter Sauce	#623 Eight (6 oz.) Filet Mignons, & One (4 oz.) Pkg. of Seasoned Butter Sauce
Reg. $49.95 NOW $29.95 (plus $5.50 shipping)	Reg. $74.00 NOW $49.95 (plus $5.50 shipping)

Special prices good thru 12/31/90. Extra charge for Alaska/Hawaii gifts.

For these and many other great gift specials, have your major credit card handy and call TOLL FREE... 1-800-228-9055! (FAX #1-402-392-8120.)

Omaha Steaks International®

DEPT. AF0111, P.O. BOX 3300, OMAHA, NEBRASKA 68103

Z·U·N·I

Mary Laura's

NATIVE AMERICAN JEWELRY

Direct from the Zuni Pueblo

Special Offer
The Set For Only
$136

Jewelry shown actual size

Squash Blossom Natewa Earrings $56
State clipped or pierced

Wide Pettipoint Natewa Bracelet $96
State wrist size in inches

Sterling Silver and Gem Turquoise

CATALOG $2.00 or free with purchase

VISA • MASTERCARD • AMERICAN EXPRESS

TO ORDER CALL TOLL FREE 1-800-662-4848

Toll Free FAX 1-800-468-3236

Mary Laura's • S • 701 Carlisle Bl. NE • Box 12615 • Alb., NM 87195, U.S.A.

By Bailey White

I'm all suited up, and a fireman for life

I am a first-grade schoolteacher, a small-sized woman, not very brave. I have no mechanical sense, loud noises make me jump and I'm afraid of heights. Why, then, was my hand raised when they called for volunteer firemen down at the community center? To establish a fire department in our area we had to have at least 11 volunteers; only 10 hands were up. I was in the thrall of that good old rural community spirit. I'll be saving lives and property, I thought, raising my hand higher and higher. It was a noble gesture. Besides, I told myself later that night in a saner moment, surely, in a month or two, someone will come along and take my place.

Our training course lasted ten weeks. Every Tuesday and Thursday night from 6 to 10 we were down at the agricenter tying slipless knots and learning about toxic gases, types of fire streams and the laws of heat flow. We squirted great holes and troughs in the sawdust of the stockyard with a two-and-a-half-inch nozzle and spent a lot of time crawling around blindfolded in the livestock arena rescuing one another. I was everyone's favorite victim. I'm easy to drag. There were contests to see who could get completely outfitted in under two minutes. I always ended up three minutes late, with several female snaps whose male counterparts could not be found and the red suspenders between my legs. I had nightmares about "flashover"—instant and complete conflagration—and being shut into hot, dark, smoky places. My replacement didn't appear.

It came time to order our "turnout gear." It didn't come in my size. The sleeves of the smallest coat covered my hands. The smallest pants were so big that I tripped over the cuffs when climbing the ladder. My suit had to be specially made. It took three months. When I pulled it out of the box, it looked like evening garb for one of Beatrix Potter's rats. It fit perfectly.

"But I don't want to be a fireman," I complained to our chief. "I'm not good at it. I'm a schoolteacher. Can't you find someone to take my place?"

"With what that suit cost the county," said our frugal chief, Lamar, "you're going to be a fireman for life, or until you can talk some little shrimp of a volunteer into taking over your gear." No shrimps showed up. It looked like I was going to be a fireman for a good long time.

I started getting used to it. They elected me secretary because of my neat first-grade-teacher printing, and they taught me how to work the pumper. I wait for the man at the end of the line to holler "Charge it!" Then I flip three switches and make the gauge read 100 pounds before I open the valve. I also have to scrub the hose after every fire. Not very heroic.

The other day, though, I got my chance. There was a wreck on Route 84, a head-on collision. Our jobs were to disconnect the batteries of both cars, wash any spilled gasoline off the road, direct traffic and help the Emergency Medical Technicians. I was at my station, ready to "charge it." But there was no spilled gas. Lamar was directing traffic.

A woman was lying in the grass beside the road. She looked dead to me, but the EMTs, who are finer judges of these things, were hovering over her, monitoring her diminishing vital signs and giving her little puffs of oxygen through a tube up her nose. One of the EMTs motioned me over.

"Her Bible. She wants her Bible. See if you can find it," he whispered earnestly.

The road was strewn with debris. Broken glass, papers, a rug, a dog leash, a Mickey Mouse hat. But no Bible. Frantically, I rummaged through the wreckage. I remembered a story I'd been told about Stonewall Jackson, whose life had been saved when the Bible he carried over his heart deflected a Yankee bullet. Finally, peering through a chink into the trunk of the car, I thought I spotted it. The lid was jammed shut. I got a crowbar from the fire truck and pried it open. But the book inside wasn't a Bible. Instead, it was a much-read copy of *Lady Chatterley's Lover.* What was I to do? Should I tell the EMT there's no Bible? But the woman was so pale, and so still. I had read about the enormous power of suggestion. The book had the heft and bulk of a Bible. I could just . . . But what if she died? The God some people believe in might send a person straight to hell if she died with *Lady Chatterley's Lover* in her hands.

Then something came over me. It felt like the same thing that made me raise my hand in the community center. I took the book and placed it on her chest. I folded her hands on top of it. She hugged it and caressed the cover. Within minutes the color rose to her cheeks, her eyes fluttered open, she sniffed a long drag of oxygen through the tube, moaned and said, "Where am I? What's happening to me?" And as she gazed into the relieved faces of the EMTs I deftly tweaked the book from her grasp and replaced it in the trunk of her car.

I may not be the biggest, bravest fireman in my county, but on that day, with a little help from D. H. Lawrence, I'm pretty sure I saved a life. It gave me a heady feeling.

Last week Lamar called me up. "There's a little man here. About your size. Wants to be a fireman. Want to let him try on your suit?"

"Nope," I said. "I'm a fireman for life."

INTRODUCING A WHOLE NEW CLASS OF AMERICAN SEDAN: WORLD CLASS.

The totally new 1991 four-door Regal.

Stylish and sophisticated, Regal Sedan comes with an impressive list of standard features like air conditioning, four-wheel power disc brakes and four-wheel independent DynaRide suspension. The list of available features is equally impressive, including: Dual ComforTemp climate control compact disc player with Concert Sound Super Soft leather seating areas. Also available is a powerful 3800 V-6 engine with tuned-port injection. Most importantly, Regal Sedan is a Buick built to further enhance our reputation for quality. As one measure of what this effort means, the J.D. Power and Associates 1990 Initial Quality Survey℠ ranks Buick the most trouble-free American carline—for the second year in a row.* The new Regal Sedan. See it at your Buick dealer today. For more information, call 1-800-423-6787.

THE NEW SYMBOL FOR QUALITY IN AMERICA.

BUICK

*J.D. Power and Associates 1989 and 1990 Initial Quality Surveys.℠ Based on owner-reported problems during the first 90 days of ownership.

GM

Let's get it together...buckle up.

©1990 GM Corp. All rights reserved.
Regal is a registered trademark of GM Corp.

Gate to gate service.

Standing under the torii gates of Kyoto, you're a long way from where you began this journey. But United made it easy.

With nonstops to Japan from five U.S. gateways, United gives you the convenience you need, and a level of service that makes passing through a pleasure.

Come fly the friendly skies.

UNITED
AIRLINES

TOKYO • OSAKA • HONG KONG • SEOUL • TAIPEI • SYDNEY • MELBOURNE • BEIJING • SHANGHAI • AUCKLAND • SINGAPORE • MANILA • BANGKOK